SEPTEMBER 15, 1917.

WHOLE SERIES, VOL. XLI. No. 9. THIRD SERIES, VOL. XXXIII.

SEP 24 1917
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The THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

A Monthly Journal of Practical Therapeutics

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EDITORIAL OFFICE, N. W. Cor. 18th and Spruce Streets, PHILADELPHIA, PA.

SUBSCRIPTION RATES:

United States and Mexico, one year,	Two Dollars.
Canada, one year,	Two Dollars and Fifty Cents.
Foreign Countries (postage prepaid), one year,	Ten Shillings.

E. G. SWIFT, Publisher, DETROIT, MICHIGAN, U. S. A.

FOREIGN OFFICES:

LONDON, ENGLAND—19 & 20 Great Pulteney St., W. SYDNEY, N. S. W., AUSTRALIA—125 York St.
WALKERVILLE, ONT., CANADA. MONTREAL, QUE., CANADA—118 St. Paul St., W.
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Whole Series, Vol. XLI. DETROIT, MICH., SEPTEMBER 15, 1917. Third Series, Vol. XXXIII, No. 9.

ORIGINAL COMMUNICATIONS.

THE SURGICAL TREATMENT OF PELVIC INFECTIONS AND WHEN IT SHOULD BE EMPLOYED.

BY E. E. MONTGOMERY, M.D., LL.D., F.A.C.S.,

Professor Gynecology Jefferson Medical College; Gynecologist to Jefferson and St. Joseph's Hospitals.

The knowledge of pelvic infection, its source and origin, has been confined to the last four decades. Inflammation of the pelvic structures had long been known and studied, but without a proper appreciation of its causes. With the introduction of the known responsibility of microörganisms for all inflammatory changes so generously furnished the profession by Pasteur came the information furnished by such pioneers as Lawson Tait, and so brilliantly demonstrated and promulgated as to sweep the medical world with the conviction that surgery, and surgery alone, afforded the panacea required for the relief of all such infective processes. This idea was confirmed and apparently justified by the statements of such investigators as Noeggerath, that gonorrheal infection once extended to the uterine appendages was never cured. As this form of infection was directly or indirectly responsible for the great majority of pelvic infections in the woman, the conclusion that the infected uterine appendages should be removed seemed a proper one. As such an infection was regarded as incurable after the invasion of the uterine mucosa, disease of one tube was asserted by Tait to be a proper reason for the removal of the unaffected one, as the latter would soon become infected from the extension through the diseased uterine canal, so that it was an economic process to remove it while the abdomen was open. So widely was this idea promulgated and accepted that it began to be feared the future of the race would be affected by the number of women sterilized. Experience fortunately demonstrated the fallacy of these views, and it is with the purpose of formulating what may be considered saner principles of treatment that this article is written.

By surgical treatment has been understood sacrificial measures. Accepting the view that the condition was incurable, the retention of organs in which the infection could be fostered and from which its distribution could be promoted was worse than folly, hence a radical operation; but when it was demonstrated that the progress of the infection could be not only arrested, but the function of extensively infected organs also restored by palliative measures, the human waste produced by such measures became wofully manifest. Peritoneal accumulations, localization of pus in a tube or ovary, accessible through the vault of the vagina, made it seem desirable that such collections should be drained previous to any radical procedure, and not infrequently the patients would be so much improved they would refuse further treatment. The complete recovery of such patients led both physician and patient to regard such tentative treatment more desirable than a radical measure. Its advantages were that the barriers which nature had erected against spread of infection were respected, the collection was evacuated in the direction of least resistance, and the patient was saved further absorp-

tion of toxic products. The important considerations were that the incision should be free so that there should be no opportunity for retention of the products of suppuration, that all pockets should be broken open and the retention sacs spread out, that the cavities should be well packed with gauze supplemented by split tube drains.

This procedure was not always free from danger, as the procedure was more or less a blind one. It was not always easy to differentiate a tubal collection from a distended coil of intestine. No puncture should be made until the sac is so outlined and its connection with the uterus certain as to leave no doubt of its relation. Puncture of an intestine need not, however, be considered as reason for immediate abdominal incision, as it will close frequently without any trouble further than the immediate annoyance. All such openings tend to close of themselves unless there is an obstruction of the lumen of the gut lower down, in which case it will remain open and the bowel contents make their exit in the direction of least resistance. When, however, whether from twists of the bowel, bands of adhesions, or masses of exudate the caliber of the intestine is contracted, the fistula will prevail until the intestine is loosened. Drainage of pelvic collections is a very important consideration in the arrest of a spreading infection. Where such a collection is recognized through the posterior fornix of the vagina the latter should be opened early and the drainage supplemented by continuous instillation of salt solution (Murphy) per rectum, with the patient in the Fowler position. The salt solution passes rapidly through the walls of the intestine and thus washes the peritoneal cavity. Proctoclysis used without drainage should be carefully watched to see there is a proportionate escape of the water through the urine, as otherwise there would occur an ascites. I have seen the abdomen become greatly distended with fluid where this precaution was not observed. As indicated in a previous article, surgery should not be resorted to when the disease is not localized, nor in acute processes, unless a collection, as has been indicated above, can be reached through the vagina without danger of breaking down nature's barriers.

Operation is indicated when the disease is localized by a palpable collection in the pelvis, tubes, ovaries, or the uterine walls. Probably the most frequent seat of such collection is in the pouch of Douglas, due to the extension of infection through the tubes, infecting the peritoneum, causing a local peritonitis which is quickly walled off, and may form quite a large mass which will lead to thickening of the peritoneum, extension to the extraperitoneal cellular tissue, and the formation of small pockets of pus and very extensive exudate. Pressure may be made upon the bladder or rectum, causing great distress, and such collections may break into one or the other, greatly complicating the condition and adding to the discomfort of the patient. Ischiorectal and prevesical abscesses may result, and may be overlooked unless the surgeon is on his guard in making the investigation. The tubal abscess is, next to the collection in the pelvis, probably the most frequent. The virulence of the infective process leads to rapid sealing of the tubal ends, and the accumulation in the tube forms a pyosalpinx. Not infrequently the wall is permeated and greatly thickened, the adjacent structures become infected, and, in the effort to prevent the spread of the inflammation, the intestines, omentum, bladder, and uterus assist in forming the wall. Infection of the uterine sinuses not infrequently leads to multiple or miliary abscesses in the lateral wall of the uterus and extensive destruction; the abscess formation through rupture and escape of its contents into the peritoneal cavity or its dissemination to the periuterine cellular tissue results in a rapid loss of vitality, and very frequently the loss of the life of the patient.

The method of treatment must necessarily depend upon the site of the disease and the extent of the lesions. As has been indicated, the evacuation of the focus through vaginal incision may sometimes be serviceable, and should be employed when it will serve the purpose of easy access to the con-

dition. When the tube or ovary is the seat of the lesion and the more acute symptoms have subsided, the abdomen should be opened and the offending tube removed. But suppose that one tube is so destroyed that there is no question as to the wisdom of its removal, and the other tube with its abdominal end open but vomiting milky or purulent fluid appears a serious menace, what shall be done? Tait would have answered that as the infection reaches the tube through the uterus, the second tube, though it be free from inflammation, will become infected and consequently should be removed to prevent the patient suffering inconvenience, and the probable necessity of a second operation. The evident infection of a tube, then, should be considered a positive indication for its removal. Experience, however, has disclosed that such cases under proper measures will recover without sacrifice of the structures and will have the function restored. The plan of treatment I have successfully instituted in a large number of cases has been to milk out the contents of the tube into some pads of gauze protecting the peritoneal cavity from infection. The tube is firmly squeezed so that the exudate from the thickened mucosa is forced out through the tubal orifice. The cases have recovered without any disturbance of convalescence. The effort should be made to save, rather than to sacrifice.

In patients in whom the tubes are closed but the acute inflammation has long subsided, leaving them slightly distended with serous contents, the adhesions should be broken up and the closed tube incised on its convex surface longitudinally. This procedure is preferable to the method of cutting off the end and suturing the mucous and peritoneal surfaces. The longitudinal incision results in an eversion of the mucosa due to the contraction of the circular fibers of the tube, necessitating only a stitch on either side to maintain the opening. Such an operation should not be considered if the tube were filled with pus as the destructive state would preclude restoration to a healthy condition, and if retained would endanger the health and life of the patient. In all operative procedures the greatest precaution must be observed to prevent the spread of infection, and where necessary drainage promoted. Drainage was formerly practiced through the lower part of the wound, but we now employ wherever possible vaginal drainage, because it empties by gravity the most dependent portion of the peritoneal cavity, that to which contained fluids gravitate.

When the tubes have been destroyed by the inflammatory changes and their retention is likely only to prolong the suffering of the patient, and even endanger her life, the wisdom of their removal is not to be questioned. Even in such cases it is better, where possible, to retain an ovary or portion of one so that the change of life shall not be too overwhelming. The well-accepted theory that the ovaries furnish a secretion which with that of the other internal glands influences and governs vasomotor action makes it desirable that this balance shall not be unduly disturbed. Cases occur, however, where it is impossible to consider such action, and then the unpleasant symptoms must be counteracted if possible by other measures. This action is a want of coördination of the vasomotor functions, manifested by hot and cold flashes, chills, gasping for breath, irregular heart action, giddiness, faintness, and disturbance of mental action. The mental disturbance may vary from hysteric manifestations to absolute mental derangement.

The condition demanding the removal of the ovaries may well be considered in many cases as requiring partial or complete removal of the uterus. The latter organ is no longer of advantage, and when hypertrophied and the seat of infection by pressure upon the imprisoned nerves in subsequent contraction may be the cause of marked disturbance of the nervous system. When the cervix has been the seat of lesions, as extensive lacerations with eversion of the mucous membrane, or where there is considerable glandular degeneration of the cervix, the entire organ should be removed, for these are the cases in which carcinoma may follow partial hysterectomy.

This complete removal of the internal genital organs may seem a great mutilation of the person of the patient, and it is; but the removal of a part or the whole of the uterus is nothing like so disastrous in its effect upon the vasomotor equilibrium of the woman as is the excision of the ovaries. It is the ovaries that furnish the internal secretion which influences the recurrence of menstruation, prepares the uterus for the advent of the possibly fertilized ovum, and with the secretion of the other internal ductless glands maintains a healthy equilibrium.

The governing principles of the conscientious physician should then be: (1) To save rather than to sacrifice. No organ should be removed where patience and judicious treatment afford an opportunity for its retention and the restoration of the patient to good health. (2) Where sacrifice seems necessary, if the condition of the organs will permit the retention of an ovary or at least a part of one, it should be retained, for even if there is no longer opportunity for procreation a portion of an ovary will permit the formation of the directing secretion, and prevent the annoying symptoms associated with premature menopause. (3) Where both ovaries are so diseased as to make the retention of any part of them dangerous to the health and life of the patient, the uterus showing indications of extensive disease, the latter organ should be partially or entirely removed according to the condition of the cervix.

SERUM THERAPY.[1]

BY RANDLE C. ROSENBERGER, M.D.,
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In bringing the subject of serum therapy before you, it is a singular fact that this is one branch of bacteriology that has really made great strides, not only as a method of cure, but also in relation to prophylaxis in disease.

At the present time there is a considerable number of infections in which serum therapy is concerned, and, naturally, serums resolve themselves into classification as to their use and method of administration.

We have antitoxic, antimicrobic, antimicrobic and antitoxic, medicated serum, autoserum, and homologous serums.

The methods of administration of the different serums vary as to what disease we are dealing with—from merely a subcutaneous injection to an intravenous, intraspinal, or intramuscular, and the apparatus used either an ordinary antitoxin syringe or inoculated by gravity. Local applications of serum (horse or human) have also been used in various maladies.

In the intraspinal method it has been recommended that attention be paid to the blood-pressure and for symptoms of collapse, and when the blood-pressure falls 10 mm. in adults and 5 mm. in children, the fluid should be allowed to pass out by gravity method.

In human pathology, the following diseases have been treated by one or other of the above types of serum: diphtheria, tetanus, cholera, dysentery, meningitis (influenzal, meningococcic, pneumococcic), pneumonia, undulant fever, anthrax, typhoid fever, gonorrhea, typhus fever, bubonic plague, hay-fever, and infections by streptococci, by staphylococci, and other organisms. An antiserum for streptococcus infections should be polyvalent, as there are so many strains of streptococci in human pathology.

In animal pathology, experimental as well as natural diseases, good results have been obtained in influenzal meningitis, B. botulinus infections, Asiatic cholera, bacillary dysentery, hog cholera, and anthrax.

The method of action of autoserums in the treatment and cure of diseases does not depend solely upon destruction of the infecting bacterium, but usually is the result

[1]Read before the Medical Society of the Philadelphia General Hospital, May 7, 1917.

of a combination of lysis with increased phagocytosis, due to simultaneous presence of bacteriotropins or immune opsonins. These conform more strongly to the theory of Metchnikoff regarding the relationship of bacteriolysins to leucocytic products and phagocytosis.

The question of anaphylaxis or hypersensitiveness to foreign serum or protein must always be borne in mind, and it is a good procedure where an antiserum is about to be administered to inquire if the patient is susceptible to what is known as cat asthma or horse asthma, brought about by the odor of these animals. I know a physician who, on coming into a laboratory where a few guinea-pigs are kept, is immediately seized with sneezing and coughing. In the case of susceptibility to horse asthma, or the condition brought about by the odor of the animal, another serum could be administered (ox, goat) which would not be attended by any untoward symptoms. Injection of a very minute quantity of the serum or protein intradermally can be performed and a reaction noticed in a very short time, so that if idiosyncrasy exists it can be guarded against.

Anaphylaxis to foreign serum or protein can be compared exactly to food idiosyncrasies, where individuals cannot partake of the simplest foods, such as eggs, certain meats, fish, berries, and many other foods, without suffering from some disturbance of the alimentary canal, or the skin.

This condition must not be confounded with serum disease, as this latter affection is the result of large doses of serum, and the symptoms come on after a week or ten days; whereas in anaphylaxis, symptoms occur almost immediately after an injection of antiserum.

The exact nature of anaphylactic shock is unknown, but it is thought to be the result of a ferment, and in experimental animals definite lesions, as ulcer of the stomach, emphysema, and hemorrhagic lesions in other organs, have been found.

The use of the antitoxin of tetanus at the present day is mostly as a prophylactic agent, inoculations being made into the spinal canal, intravenously, subcutaneously, and intrathecal.

If a wound of entrance is found and inoculation of antitoxin be made around the wound, the disease is usually prevented, and if a little stiffness or tendency to stiffening sets in, another dose of antitoxin is given.

The prophylactic dose of tetanus antitoxin should be about 1500 units given subcutaneously, around the site of injury, and repeated in a few days. Here, again, the dose given may appear to some as too small, because as much as twenty to twenty-five thousand units have been given in single doses. It has even been suggested by some that antitoxin in the form of a powder, or the impregnation of a pad with the remedy, be applied to a wound where tetanus is feared.

Regarding the cure of tetanus with antitetanic serum, reports are very variable. In acute cases of tetanus the results as a rule are not very encouraging, while in slowly developing cases a much better prognosis and outcome is generally the rule. It appears that if no prophylactic dose of antitoxin is given the organism produces an amount of toxin which selectively attacks the nervous structures, anchors there and seemingly cannot be neutralized, and as a result death occurs. Therefore, in every instance where a wound is received as a result of friction, powder burn, a crush or laceration, antitetanic serum should be injected as a routine procedure, just as much so as antiseptics are used in cleansing a wound.

Regarding the antitoxin of diphtheria as a remedy in diphtheria, a great deal has been written and thousands of lives have been saved. Just as many more will be saved if the physician will act at once in all cases in which a membrane is seen, and inject antitoxin, even before a bacteriological diagnosis is arrived at. It seldom does harm, and, in many cases not necessarily due to the B. diphtheriæ (as in streptococcus and pneumococcus infections), the remedy has done good irrespective of the bacterium causing the infection.

We have heard of good results of the

action of diphtheria antitoxin in other severe diseases, such as noma and whooping-cough, but the number of these cases is so small that these favorable results cannot be taken as wholly consistent; nevertheless it should be given a trial.

Regarding the dose of the remedy, variance exists and perhaps always will exist, but I believe that where severe cases of the diseases are met large doses are demanded, and consequently recoveries will be many. It is regrettable that a certain number of practicing physicians at the present day still look upon diphtheria antitoxin with skepticism. Diphtheria is a disease so well known that it is most always easily recognized by the membrane. This latter structure may be located deep down in the trachea and not visible; or it may be of the transparent or hyaline variety, barely recognizable; or it may be in the nose. But where the toxic symptoms are pronounced, doubt should not exist for a moment as to the remedy to be used. Hesitate, and before one is aware the heart, the kidneys, and perhaps other viscera are saturated and acted upon by the toxin. Too late, antitoxin is administered, death occurs or paralyses develop; albuminuria and functional diseases of the heart may be brought about; and these conditions are blamed upon the antitoxin. There should be no hesitation where a membrane is seen, irrespective of its bacteriologic diagnosis, in the immediate recourse to antitoxin. There are no ill effects, except in the cases of hypersusceptibility to the serum or anaphylaxis.

Regarding the prophylactic use of diphtheria antitoxin, a great amount of this remedy can be saved, especially by institutions and schools, where a Schick reaction is performed. This test consists in the introduction subcutaneously of a very small sublethal dose of diphtheria toxin. If there is redness around the area in twenty-four hours, which persists for seven to ten days, the reaction is positive, indicating that the body is deficient in antitoxin and does not contain the normal amount (approximately 1/30 of a unit to one Cc.). Where a negative reaction is obtained, which indicates that the individual possesses the normal amount of antitoxin, no antitoxin is administered as a prophylactic (or a mixture of antitoxin and toxin as advised by Behring), and in this way a great saving of antitoxin is brought about. It has been found, as recently worked out by Park of the New York Board of Health, that individuals who show a negative Schick reaction probably remain protected for years and even for life. During an outbreak of diphtheria among children previously tested, it would be necessary to give antitoxin to those who give a positive reaction and class work could then continue without interruption. Occasionally a child giving a positive Schick test develops the disease, but this is only exceptional.

Behring's method of immunization consists in inoculating the toxin with antitoxin, holding that the toxin when given in properly regulated dose—being sure that it does not contain a trace of the paralyzing element of the toxin—is capable of producing antitoxin. It has been claimed that danger might arise from this inoculation in bacillus carriers, but it has proved to be non-dangerous in these individuals. Two injections should be given, the second one usually about ten days after the first dose, although a single injection may produce sufficient protection. The theory is that by the injection of this small dose of toxin the body cells themselves would be stimulated in the production of antitoxin.

In cerebrospinal meningitis, the great variability of the exudate in the spinal canal renders the injection of a fixed amount of fluid a dangerous procedure. When the flow is free, the fact is indicated by a drop of fluid every three to five seconds, and if the increased pressure which is evident in some cases is reduced to normal, it may be a dangerous sign. In some instances no change in blood-pressure is noticeable, and in these cases fluid may be removed until the flow is diminished to the rate of a drop every three to five seconds.

By gravity method of administration of antimeningococcic serum at least ten minutes should elapse in administering 15 Cc. of serum. A total drop of 20 mm. of Hg

indicates that sufficient serum has been injected.

The antimeningococcus serum acts probably in three ways as a curative agent: first, as an antitoxic agent; second, as a bactericidal agent; and third, on the presence of bacteriotropins or immune bodies, which facilitates the phagocytosis of the meningococci. The mortality in this disease has very appreciably been diminished, and better results could no doubt be obtained if diagnosis is made early and serum introduced at once. Wherever a spinal puncture is performed and a cloudy fluid withdrawn, a dose of antimeningococcus serum (30 Cc.) should be given at once.

There is no doubt about the curative value of the serum if given early and frequently repeated—*i.e.*, two or even three times a day, even though by spinal puncture only one-half or less of the amount of cerebrospinal fluid is obtained.

In a recent epidemic of 67 cases I have seen 30 Cc. of serum given where only 5 or 10 Cc. of fluid were withdrawn. In only a very few cases was injection of the serum observed with the blood-pressure, and in only one case was collapse noticed, and this occurred as a result of too rapid introduction of the serum.

In croupous pneumonia, serum treatment is not exactly new, but at the present time, owing to more accurate classification of the types of organisms causing the disease, better results from several standpoints have been obtained. According to Cole and his coworkers there are different types of pneumococci, and for several varieties or groups of these organisms a serum has been obtained.

Pneumococci are thus divided into four groups. In group one are included all the races against which serum one (a horse serum obtained by inoculating with a pneumococcus) is effective; in group two are included all those against which serum two is effective; in group three, those of the pneumococcus mucosus group; and the fourth group includes all types or strains against which serums one and two are not effective and which do not belong to the mucosus group. The organisms of group three differ from the others in that the serum of immunized animals possesses no protective power, and it induces active but not passive immunity. Further, it has no agglutinating power, unless the capsule of the organism is removed by treating with dilute hydrochloric acid and exposing the organism to 80° C. for fifty minutes. This serum which agglutinated the altered organisms failed to agglutinate the organisms of group one and two.

In the case of a group organism having been isolated from a case of pneumonia, this type persists throughout the course of the disease. It is possible, according to Cole, that the prevalence of cases due to the various types varies from year to year and in different places, which may explain the variation in mortality observed in different times and places. The lowest mortality has been due to the organisms of type four.

To employ a serum effectively it is necessary to quickly determine the type of organism concerned. This is done by either puncturing a lung and obtaining a culture, or by injecting the washed sputum into the peritoneal cavity of a mouse, and after five or six hours washing the peritoneal cavity out with salt solution and centrifugalizing. This method threw the cells down and left a suspension of the organisms. This suspension was used for the agglutination test, and if the organism fails to agglutinate with types one and two it is useless to undertake serum treatment.

Previously only 10 to 20 Cc. of serum were used in the treatment of the disease, but Cole uses anywhere from 50 to 100 Cc. of serum (diluted one-half with salt solution) intravenously, after having previously given a dose of 0.5 Cc. of serum subcutaneously to determine hypersensitiveness. The dose was repeated not oftener than every twelve hours, some receiving 190 to 460 Cc. of serum, and one receiving 700 Cc. Of more than thirty cases due to group one all recovered but one, while of group two, eight cases were treated and two died. As usual, treatment should be instituted as early as possible. In all the cases except the fatal ones, the serum has had an ultimate favorable effect in lowering the

temperature and shortening the course of the disease, apparently lessening the degree of intoxication, and there was practically no extension of the involved area where treatment was commenced early.

It also appears that one inoculation of the serum will cause the organisms to disappear from the circulation, or, if not present or demonstrable in the blood, it prevents invasion by the organism. It is possible that the serum is mostly antibacterial, though experimental work has indicated that it may possess some antitoxic effect. Personally it is a question whether a polyvalent serum would not have as good effect as the specific type serum.

It has been proved that the serum of a syphilitic patient obtained after a dose of salvarsan possesses bactericidal or spirocheticidal action.

As a consequence, some cases of locomotor ataxia, paresis, and other syphilitic infections of the central nervous system under this serum treatment may show great improvement.

It should be used of course as early as possible in syphilitic conditions of the cord, as injection of the serum will not prove of any benefit where tissue has been actually destroyed.

It should also be recommended as an adjuvant to the intravenous injection of salvarsan, as it is our idea to obtain an intensive action upon the treponema pallidum.

The only necessary preparation of the serum is to obtain the blood anywhere from thirty minutes to an hour after the injection of the drug (salvarsan or neosalvarsan), separate the serum and heat the latter to 56° C. for one-half hour, then inject with admixture with sterile salt solution or undiluted. The dose of serum is usually the amount of fluid withdrawn, whether this be a few Cc. or as much as 30 to 50 Cc. Mercurialized serum has also been recommended in the same way as salvarsanized serum.

In snake venom it has been found that there are two bodies at fault—toxins—one being largely neurotoxic and producing paralysis of the respiratory centers, and the other being hemotoxic, an irritant producing local necrosis of tissues and hemolysis.

According to Calmette and Fraser, an antivenom has been obtained by inoculating the horse with cobra venom, heated to 70° C. for an hour. The serum obtained from such an immunized horse is found to neutralize the toxic phenomena, but does not relieve the local irritant action from the bite.

An antiserum has also been obtained from horses immunized against ragweed and golden-rod which has been used in the treatment of autumnal catarrh, or hay-fever. Here it must be remembered that different pollens act as excitors of the malady, and hence until a polyvalent serum is obtained uniform results, either as cure or for prophylaxis, will not be obtained.

Blood serum from the renal vein of a goat, dog, or sheep has been recommended in cases of acute and chronic nephritis, for the reason that it is thought that the blood from this region contains some of the internal secretion of the kidney, which acts favorably upon the kidneys and emunctories in general.

Normal human blood serum, as well as horse serum, has been recommended in some of the chronic persistent skin diseases attended by itching, such as pruritus of pregnancy, urticaria, malignant pemphigus and senile pruritus, and forms of eczema. Bed-sores, ulcers, even gangrenous conditions, have been treated with horse serum or human serum or ascitic fluid with more or less success by the simple application of these fluids. Icterus neonatorum and purpura hemorrhagica have been treated with whole blood.

In tuberculous and non-tuberculous effusions into the serous membranes, autoserums have been used, but with very little if any beneficial results.

It must not be forgotten that autoserums have been tried in diseases such as smallpox, leprosy, erysipelas, and gonorrheal arthritis, but with results that are not at all conclusive.

In scarlet fever, several observers have demonstrated the value of injections of blood serum of convalescents, in several

cases of the disease, where restlessness, delirium, and evidences of heart failure are present.

A mixed serum can be used—that is, from several donors or from a single donor. Usually the blood is obtained from a donor on the eighteenth to the twenty-fourth day of their disease, and a Wassermann test previously made. Apart from the blood serum, the whole blood can be administered, and these injections are made intravenously in the case of serum in the dose of 50 Cc. for children and 100 Cc. for adults.

In the administration of the whole blood intramuscular injections are recommended. The groups of muscles usually chosen are the gluteal muscles, the outer regions of the thighs, the calves, and the triceps muscles. Thirty Cc. was the dose usually given, while some received as much as 250 Cc. Normal horse serum seemed entirely without any effect, while blood serum from an ordinarily healthy individual has exerted some beneficial effect, but not as markedly as from the scarlet fever convalescent.

Of late a great amount of work has been done in the treatment of anterior poliomyelitis with the blood serum of convalescents and also with horse serum.

Regarding the action of the serum, it was found that both the immune serum and horse serum brought about a markedly increased cellular content of the spinal fluid in acute cases.

Polynuclear leucocytes were found to predominate, but no bacteria were demonstrable.

Regarding the curative effect of the immune serum, it appears that if the patient is treated in the preparalytic stage paralyses are few or do not occur.

In the paralytic cases it is claimed that there is improvement in the paralyses, while in the bulbar cases very little improvement if any occurred.

Further observations and experiments on animals (monkeys) will have to be undertaken before the serum treatment will be sufficiently understood to be used as the specific treatment of this disease.

THE CARE OF FOCAL INFECTION FROM THE DENTAL STANDPOINT.[1]

BY THEODORE D. CASTO, D.D.S.,

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The teeth and the alveolar process are transitory tissues. They are end organs; therefore they are the first to receive the influence of any toxemia or the impress of age.

The alveolar process of each superior maxilla includes the tuberosity, and extends as far forward as the median line of the bone, where it articulates with the process upon the opposite side. It is narrow in front, and gradually enlarges until it reaches the tuberosity, where it becomes rounded. The process is composed of two plates of bones, an outer and an inner, which are united at intervals by septa of cancellous tissue. These form the alveoli for the reception of the roots of the teeth. In some cases the buccal and labial surfaces of the roots of healthy teeth extend nearly or quite through the outer bony plate and are covered by the peridental and mucous membranes only.

The growth and the stability of the teeth depend upon the thickness and the strength of the alveolar process. Our ancestors of Southern and Central Europe are dark-complexioned and have wide dental arches, in which we find some of the most capable teeth. On the contrary our light-haired cousins of the North have a narrow arch, the alveolar arch tapering down to a very thin plate.

This alveolar border is the trellis that supports the gum at the gingival border of the tooth. When halisteresis occurs through this bony margin, then we have the so-called recession of the gums. This recession of the gums follows the recession of the bone and does not take place until after the bone has receded; this more often occurs in our

[1]Read before the Clinical Society of the Mt. Sinai Hospital, April 24, 1917.

light-haired patients, and because of the thinness of this tissue and the poor circulation supplied to the gingival border depletes it in such a way that it readily absorbs toxins, causing slight signs of inflammation, followed by soreness of the gum margin and a decided congestion which determines the tendency to hemorrhage. The bacteria often at this period penetrate well into the bony tissue, causing its loss, and when this breaks down it fills with pus, which terminates into a local or general pyorrhea alveolaris.

If the circulation of these end organs could be kept near normal we would have no interstitial gingivitis and thus no pyorrhea alveolaris. The mucous membrane of the mouth and the pericemental membrane of the tooth roots should form a beautiful festoon around the gingival margin.

The deciduous teeth are twenty-four in number and are erupted from the sixth to the twenty-fourth months. The permanent teeth are erupted from the sixth year to the fourteenth year, except the third molar (wisdom), which has no definite time to appear, but is really scheduled as coming from the seventeenth to the twenty-fifth year, although there are some cases of their erupting after fifty years.

The deciduous teeth are often badly broken down by caries by the third or the fifth year. The pulp being freely exposed becomes infected and thus carries bacteria to the adjoining tissues. Their roots are absorbed early, and such infections do not usually cause any deep bone trouble and are often passed over very lightly, as no one, at least the parents, are deeply concerned by the things that happen to the first teeth as they are to be replaced in a few years.

These infections cause a slight swelling, and the tissue being thin and vascular an abscess is readily formed, followed very soon by a fistula which continues to drain into the mouth and at other times is closed, and is thus thrown into the circulation, there to work whatever ravages to the general system the character of these bacteria may cause. The great hazard in the young patient is the small amount of pain and lack of attention by nurse or parent. The deciduous teeth decay very rapidly and often form very sharp projections, which cause abrasions of the tongue and the cheeks, subjecting these organs to the many mouth bacteria. These abrasions cause great inconvenience to our small patient, who is often so young and his experience so limited that he cannot tell us of his trouble. These rough teeth were brought to my attention very forcibly more than twelve years ago when I was trying to fill and treat the teeth for the Children's Bureau. A child of eight or nine years was brought to me who had just passed four weeks in a hospital for stomatitis. The whole trouble had arisen from these very sharp edges and from some very badly broken-down premolars, and the cause of the trouble was soon corrected by the use of forceps and polishing wheels. How much valuable time and needless expense to the Society and the State had been wasted! This was some years before we had thought of the dental interne as having any place on the hospital staff.

You may be interested to know how we treat these teeth at the Mt. Sinai Dental Clinic, which has treated nearly nine hundred cases in the last year. This clinic has been greatly helped by the mutual coöperation from the very worthy chief and his excellent staff. It has been a delight to work with a body of men who have contributed in every way so willingly to the success of our special clinic.

Always before doing anything that may abrade or break the mucous membrane of the mouth, the tissues surrounding the teeth are painted with a solution of zinc-iodine-glycerin; then these angles are made as smooth and rounding as possible. Every smooth surface that can be is retained. The cavities in the teeth are made free from all angles or overhanging walls. Then these cavities in the deciduous teeth are painted with silver nitrate, from two to four per cent, which oxidizes and turns the dentine to a beautiful black and really prevents further decay. The abscessed teeth are often made useful by opening up the tooth and placing a pellet of cotton with creosote

in it, and following this at the next visit with a treatment of silver nitrate.

If these teeth can be saved for eight or nine months, this gives time for the first molar to erupt and take up its work of mastication. Two or three cases have been presented in this clinic in which no molar occlusion could be established, and hence the sad consequence of a patient trying to masticate on six or eight incisors and a temporary cuspid.

When we look into the mouths of the juvenile patients passing through these corridors and see the awful ravages of a dental caries and alveolar abscess, we feel that we should have more dental chairs and forty men on the staff instead of eight or twelve. I cannot refrain from calling your attention to the work that might be done in regulating teeth and thus giving the bones of the face space to develop, so that the air space of the maxilla and ethmoids would respond to the treatment of the nose and throat specialist.

About eight or ten years ago William Hunter of England made a very severe criticism of the dentists, accusing them of making ill-fitting crowns and bridges which gave field for infectious bacteria. This made us take stock of the things that we had been doing and of the possible results, and the excellent researches of Rosenow, Billings and Hartzell; although some of their conclusions seemed extravagant, we are beginning to believe in them. These men claim that 95 per cent of pulpless teeth show foci of infection, but this has not been my experience. The condition of rarefied bone around the apex of vital teeth is really frequent. Others have made the assertion that where teeth have been treated and an attempted canal filling placed they have more frequently presented signs of apical infection than teeth which were broken down and not treated. This has not been our experience in this clinic, where we see many radiolucent areas around roots that have never been treated. The truth is that these specialists are not seeing the average case as it appears in an ordinary dental practice, but they are examining selective cases passed to them for consultation from many private dental offices and public clinics; therefore their experience is not the common experience, and when they speak of 95 per cent of pulpless teeth as being a menace to their host they really mean 95 per cent of the 1 per cent, because they are only examining about 1 per cent of the average dental cases.

The temporary teeth are replaced by the second dentition, and this is completed by the fourteenth year. These teeth are subject to rapid decay until the twenty-fifth year, but often from the seventh to the ninth year we find cavities in the six-year molar. The pulp is often exposed, forming an easy ingress to the general circulation of the numerous bacteria of the mouth. There is no means of destroying the oral flora, so we must interest ourselves as dentists in filling these teeth before the cavities have become of such a character as to permit these infectious bacteria to enter the circulation through the root canals.

When this has not been done the foci have been formed and the roentgenogram shows an area of radiolucens at the apex of the tooth. This is where the work of the physician and the dentist is closely related.

Here we find in these apical areas many forms of streptococcus. Streptococcus py. aureus, streptococcus viridans, staphylococcus py. aureus, pneumococcus, and diplococcus have all been isolated in this clinic from cultures of seventeen cases in which we found the following: Staphylococcus 8, streptococcus 21, staphyl. py. aureus 13, staphyl. py. albus 9, pneumococcus 13, micro. catarrhalis 18, B. pseudo dip. 8, B. fusiformis 4, strept. viridans 3, leptothrix 2, capsulatus 1, B. subtilis 2, yeast cells 2, diplococcus 1.

These are a few of the cases examined by the bacteriologist, Dr. A. I. Rubenstone:

CHILD OF FIVE YEARS.

Aerobic: Staphyl. py. aureus.
Micro. catarrhalis.
Pneumococcus.

AGED 32.

Aerobic: Bacillus fusiformis.
Leptothrix.
Pneumococcus.

Aerobic: Staphyl. py. aureus.
Micro. catarrhalis.
Streptococcus.

Anaerobic: Staph. and strepto.
B. fusiformis.
Staphyl. py. aureus.

Aerobic: Strepto. viridans.
Leptothrix.

Tooth culture: B. capsulatus.
Micro. catarrhalis.
Streptococcus.

Aerobic: Staphylococcus.
Pneumococcus.

Anaerobic: Staphylococcus.
Streptococcus.
Pneumococcus.

Staphyl. py. aureus.
B. pseudo diphtheriæ.
Micro. catarrhalis.

Aerobic: Staphyl. py. aureus.
B. subtilis.
Pneumococcus.

Anaerobic: Same.
Yeast cells present in tooth culture.

CHILD, AGED 4.

Aerobic: Micro. catarrhalis.
Staphylococcus.
Streptococcus.
Pneumococcus.

Anaerobic: Micro. catarrhalis.
Staphylococcus.
Streptococcus.

AGED 52.

Aerobic: Staphylococcus.
Streptococcus.
Micro. catarrhalis.

CHILD, AGED 7.

Staphyl. py. albus.
Streptococcus.
Micro. catarrhalis.

HEART CASE.

Aerobic: Staphyl. py. albus.
Staphyl. py. albus.

Anaerobic: Staphyl. (short).

HEART CASE—PYORRHEA.

Aerobic: Staphyl. py. aureus.
Micro. catarrhalis.
Streptococcus.

CASE OF PYORRHEA, AGED 65.

Aerobic: B. pseudo dip.
Micro. catarrhalis.

Anaerobic: Staphyl. py. aureus.
B. pseudo dip.

RHEUMATIC CASE, AGED 25.

Had a severe case of gingivitis and an abscess of two upper bicuspids.

Aerobic: Staphyl. py. aureus.
Micro. catarrhalis.
B. pseudo dip.

Anaerobic: Staphyl. py. aureus.
B. pseudo dip.
Pneumococcus.

FOURTEEN TEETH EXTRACTED.

Aerobic: Staphyl. py. aureus.
Streptococcus.
Micro. catarrhalis.
B. pseudo dip.

HEART CASE.

Anaerobic: Strept. viridans.
Staphyl. albus.

Aerobic: Streptococcus.
Pneumococcus.
B. pseudo dip.

RHEUMATIC CASE.

Micro. catarrhalis.
B. fusiformis.
Staphyl. py. albus.

Anaerobic: Staphyl. py. albus.
Diplococci.
Streptococcus.
B. fusiformis.

Also had a severe case of inflammation of mouth and pharynx.

Anaerobic: Pneumococcus.
B. pseudo dip.

Aerobic: Strept. viridans.
Staphylococcus.
Pneumococcus.
Strept. brevic.
Staphyl. py. albus.

These cultures were all made from infected abscesses of teeth extracted in the ward and from the ambulatory patients of our dental clinics. It would be futile for me to try to recite the injury that may occur to our patients from these foci of infection; you are all familiar with the gamut of disease that may follow the entry of these bacteria into the circulation, and since we know their facultative disposition as well as their selective disposition for growth our desire to eliminate their entry into the host has been very much quickened.

Perhaps relating an instance or two in which recovery has been brought about will not be amiss. One boy of ten had been in the hospital for three days, running a temperature, with symptoms of rheumatism. The radiograph showed a rarefied area around the upper left first bicuspid. The tooth was extracted, and we found that he had two pieces of wooden toothpicks sticking into each canal and into the tissue. He made a hasty and uneventful recovery. Another case was a man of twenty-three, showing symptoms of general debility, sore muscles and joints. Radiographs showed an impacted root of a cuspid tooth in a large area of rarefied bone, including the central incisor region and well into the antrum. The teeth were extracted and the patient kept in the hospital under the care of the interne for five days, and he has made a very good recovery. A Wassermann test was found negative. No smears nor blood counts were made.

The question is, what are we going to do with the pyorrhea pocket and the apical abscess? All the amebacides and vaccines that can be delivered will never benefit our patient as long as these things remain around the apex of the teeth.

One coterie of dentists are still relying on emetine, others are treating septic canals by ionization, zinc, or sodium chloride in the root canals, and some are recommending the amputation of the roots of the diseased teeth.

What do we recommend at this clinic? We try to have cultures made from all mouths showing any systemic infection. These cultures are taken from pus pockets or from the alveoli of the extracted teeth. If any of you should consult us we would advise an autogenous vaccine made from these cultures where they show streptococcus, staphylococcus, or diplococcus infections, in the hope that this might help to clear up the general condition. This could only be accomplished by the most careful attention from the internes. Wassermann tests should be made, blood counts taken every three days, and a close clinical chart should be kept.

While the mouth shows a severe case of stomatitis we can only recommend polishing four or six teeth a day, as it has been observed that even this work brings about an autoinfection. That is what I believe takes place, as the patient will have a marked rise in temperature.

Root amputation has its place as a means of restoring teeth to usefulness, but as a means of restoring a patient to health I am very much in doubt; although sometimes I do remove a root when it has been exposed by an abscess and when the tooth is of great service to mastication. This operation is suggested often in the upper third molars, when the infected areas are around one root and when the root is dissected at the bifurcation, thus removing the entire root and establishing free drainage.

HISTORY OF THREE CASES.

Case 1.—Patient, thirty-five years old; referred by his physician. Knees were stiff; soreness in his back. The pictures indicate an abscess on the upper right first molar and the lower left first molar. In the left central incisor region the pictures show a root that has been amputated for eight years. This root is carrying a pin which was supporting a plate. Although this incisor root had carried a plate for years, there were no evident signs in this radiograph that it has been long infected, as there is an area of rarefied bone all around this piece of tooth, and when it was extracted it showed that disease had destroyed all the peridental membrane and that the piece of tooth was really a foreign body just as a piece of metal or ivory would be.

CASE 1.

The statement that I wish to make is that, although this root furnished the function performed by the tooth it has never been a good thing for the patient's health. This root and the molars were extracted. Cultures were made from all the sockets and showed diplococcus. The autogenous vaccine was made, and the patient is receiving the regular dosage every five days, to which he seems to respond very favorably.

Case 2.—These pictures (Mrs. A.) are given to show how and when root amputation may be of use. The granuloma at the end of this tooth came out when the tooth

was extracted. This root is well supplied by peridental membrane in its upper half, and apical resistance might have given us very fair results, but how are we to know even from the best pictures just how far these bacteria have penetrated the membrane?

I must conclude that even if teeth may be made useful through root amputation, the patient's health demands the extraction

Case 2.—Before extraction.

where areas of this kind are shown. They should always be extracted when the patient shows systemic symptoms that are not readily traced to some cause. How futile it is to have blood counts made and vaccines delivered and leave such centers as are shown around these teeth to reinfect our patient. You could not persuade me that any tooth is worth enough as a masticatory organ to balance its chance as a source of general infection.

I must condemn the use of ill-fitting crowns and bridges, because these conditions in the mouth are ideal for the development of bacteria. Food, moisture, and correct temperature always being present demand that all these pockets and rough places should be removed, so that the saliva can wash all parts of the teeth, and the tongue and muscles may use their mechanical force in cleansing the mouth.

Case 3.—This girl of fourteen had a fall when she was nine years old which broke off a small corner from the left lower lateral incisor. When she was twelve years old, or on July 4, 1915, she had a second fall, which terminated in an abscess at the symphysis of the mandible. This abscess developed into a fistula, which would heal and then open at uncertain intervals. In October of 1915 the right lower first molar ached, became swollen, and was extracted. The patient was assured that this extraction would cure the fistula. In July, 1916, an operation on the chin was advised by the family physician, which was done by an oral surgeon in one of the West Philadelphia hospitals on January 6, 1917, the patient being retained in the hospital for three days. This operation was followed by treatments by the family physician until February 3, when the patient was discharged. On March 4 the fistula again opened, and at

Case 3.

this time the left first molar was aching and was extracted, and diagnosed as retarding the recovery in the chin. The patient came to my office on April 6, 1917, when I diagnosed the entire trouble as coming from the broken incisor, which I opened and found a putrescent pulp. There has not been any pus discharged since the second treatment on the 10th of April, and the marks of the fistula have nearly disappeared.

EDITORIAL.

HEART FAILURE TREATED BY MASSAGE OF THE HEART.

The readers of the THERAPEUTIC GAZETTE will recall that on a previous occasion we drew attention to this subject and pointed out that the term massage of the heart was applied to several widely different procedures. Some have applied it to massage or kneading of the precordium, with probably no direct effect upon the heart, but only a reflex irritation. Others have practiced so-called massage of the heart through the diaphragm during the performance of an abdominal operation when cardiac arrest was threatened, and still others have gone so far, in desperate cases, as to incise the diaphragm, pass the hand through the opening, and directly massage the heart. In the cases to which we referred in an earlier editorial there seemed to be no question that such measures served to restore cardiac action. Whether the more radical method last cited is not so grave as to be virtually death-dealing in itself is a question for debate, although reports show that, temporarily at least, the action of the heart is reëstablished or improved.

For these reasons we have noted with interest an article by Molyneux in the *British Medical Journal* of March 31, 1917, in which he emphasized the interest which has been taken of late in heart massage, when the massage was applied through the diaphragm in a patient undergoing operation. He is also familiar with the fact that, when the patient has collapsed on the operating table and has failed to respond to the ordinary stimuli, massage through the diaphragm has been practiced with advantage. He advocates, however, not permitting undue delay, thinking that desperate conditions should be met by desperate measures, and he is so confident of the value of the method that he even discusses its employment in collapse complicating operation for adenoids. Recognizing that the surgeon's hands are not sterile and that he might not have suitable instruments at hand for abdominal section, he nevertheless urges that delay may mean the loss of life and that the chance is worth taking.

He states that every case of death on the operating table that has come to his knowledge has been one in which chloroform has been employed, and that it is very rare to hear of a death under ether, an observation which is in accord with that of the entire profession, and which is the more interesting since in chloroform poisoning the heart is often widely distended and fibrillating, and therefore can be reasonably expected to reëstablish its contractions if by gentle compression its cavities can be emptied.

The cases cited by Molyneux are as follows:

A woman of sixty-three was sufficiently optimistic to believe that the enlargement of her abdomen might mean her first pregnancy, but the examination showed an ovarian tumor of great size impeding respiration. Indeed, Molyneux describes the patient as a shell surrounding a tumor, so large was the growth. The pulse was irregular, the arteries thickened, and there was a marked aortic systolic murmur. On opening the abdomen the tumor was removed, after having been aspirated, and the patient immediately collapsed, the respiration and heart both stopping. Artificial respiration and pituitary extract were without effect. The right hand was introduced into the abdominal incision, the left hand placed over the heart, and the heart massaged by a series of rhythmic squeezes at the rate of forty or fifty a minute, the right hand pressing the heart through the diaphragm against the chest wall, this being reënforced by pressure on the outside of the chest by the left hand. Molyneux states that after a short time the heart commenced to beat, circulation was restored, and the patient made a rapid recovery. Notwithstanding

his previous observation in regard to the danger of chloroform, ether was the anesthetic in this case. He believes, and probably correctly, that the collapse was due to sudden relief of intra-abdominal pressure, the tumor being so large that it took two people to lift it off the table.

His second case was that of a man with appendicitis, whose age is not given. As soon as the abdomen was opened collapse occurred. The incision was rapidly enlarged, and the right hand introduced to the diaphragm and the heart felt as an absolutely flabby organ without contraction. Massage of the heart and artificial respiration were at once commenced. After about one minute the massage was stopped, but the heart had not started. It was renewed, and the heart, at the end of the second minute, began to beat feebly. Pituitary extract and strychnine were injected, and after about five minutes the patient's condition improved so much that it was decided to complete the operation, as the appendix was distended with pus. The patient survived the operation, was sustained by continuous enteroclysis of normal saline containing adrenalin, and made a good recovery. In this case the anesthetic used was a mixture of chloroform and ether before the collapse and ether subsequently.

Further information in regard to this matter is given us in a report made by Mollison in the *British Journal of Children's Diseases* for January to March, 1917. Mollison is Surgeon to the Ear and Throat Department of Guy's Hospital, London, and reports the case of a boy of six years, slightly built, but healthy in appearance, who had a history of having had on a previous occasion bronchitis and asthma, and from whom it was considered desirable to remove the tonsils and adenoids. They prepared him in the usual way for an anesthetic, a purge being given on the day before the operation and a cup of milk at 8 A.M. on the morning of the operation. A mixture of chloroform, two parts, and ether, three parts, was administered on an open mask. The patient passed speedily into unconsciousness and the corneal reflex was never lost. The left tonsil was removed successfully, but while the right was being removed the boy struggled slightly. He was then turned on the side and the adenoids curetted. The boy did not react properly, but was found to be flaccid, respiration ceased, the pupils were dilated, and the corneal reflexes absent. The head was lowered, the throat cleared, the tongue pulled forward, and artificial respiration by Sylvester's method instituted. Although the air entered the chest quite freely, the patient's bad color persisted. Stimulants were administered, hot cloths were applied to the chest and abdomen, brandy and ether were injected subcutaneously, 0.5 Cc. of pituitrin injected subcutaneously, and another 0.5 Cc. of pituitrin was injected through the chest-wall into the heart. No response followed. No heart sounds could be heard. The abdominal walls were washed with ether and an incision four inches long was made through the ensiform cartilage to just above the umbilicus in the middle line, but there was no bleeding from the sides of the incision. The liver, which was incidentally cut, failed to bleed. The right hand was introduced into the belly to feel the heart, with no trace of movement. With the left hand on the chest wall and the fingers of the right hand behind the heart, pressure was exerted at the rate of about ninety times per minute. After some moments respiratory movements began and continued intermittently. The boy's color improved and his pupils contracted, but there was no attempt at heart contraction. After a time the operator became tired, and an assistant continued to massage the heart, Mollison injecting nearly 1 Cc. of pituitrin into the heart, guiding the needle through the chest-wall between the fingers of the right hand.

Massage was now renewed, and after about twenty more squeezes the heart suddenly began beating strongly. As soon as it was certain that the heart was beating well, the liver was sutured and the abdominal incision closed. It was estimated that the heart had ceased

beating fifteen or twenty minutes before its action was reëstablished. The whole incident lasted from 1 P.M., when the operation began, until 1:35 P.M., when the boy was returned to the ward. On his return to the ward saline infusions were given and the foot of the bed raised considerably. An hour later the patient became restless, his limbs were rigid, with choreic movements, and the intestines escaped from the wound, requiring their replacing and new suturing. The boy remained more or less unconscious for a period of seven days, and for some days had a meningitic cry, which on one occasion was almost continuous for thirty-six hours; he nevertheless finally began to improve, and seventeen days after the operation he could sit up, but still had incontinence of urine. He eventually made a perfect recovery and left the hospital about six weeks after the operation.

Mollison adds to his article the records of fourteen cases, which are summarized in the following table:

	Name of operator.	Anesthetic.	Time of ordinary methods.	Time taken to restore heart.	Method.	Operation being performed.
1.	Igelsrud.....	?	3-4 min.	1 min.	Resection of ribs and opening pericardium.	Abdominal.
2.	Lane	Ether.	2-3 min.	1 or 2 squeezes.	Subdiaphragmatic.	Ditto.
3.	Gray.....	?	?	2 or 3 squeezes.	Ditto.	Ditto.
4.	Cohen.....	$CHCl_3$.	2 min.	1 min.	Ditto.	Ditto.
5.	Crile.....	Ether.	Nil.	5-6 min.	Rubber suit method.	Exophthalmic goitre.
6.	Sencert.....	$CHCl_3$.	7-8 min.	5 min.	Subdiaphragmatic.	Abdominal.
7.	Conkling.....	Ether.	2 min.	1 min.	Through chest wall.	Region of chest wall.
8.	Smith	$CHCl_3$.	3 min.	1 min.	Subdiaphragmatic.	Examination of rectum.
9.	Ramsay.....	$CHCl_3$ and ether.	4 min.	1 min.	Ditto.	For prolapse of uterus.
10.	Rutherford...	$CHCl_3$.	1-2 min.	12 squeezes.	Ditto.	Whitehead's operation.
11.	Milne.....	$CHCl_3$.	2 min.?	1 squeeze.	Ditto.	Operation not begun.
12.	Sichell.....	C.E. and ether.	1 min.?	"A short time."	Ditto.	Ditto.
13.	Frazier.....	Ether, then $CHCl_3$.	1-2 min. or less.	2 min.	Ditto.	Hydrocele just begun.
14.	Mollison.....	C.E.	13 min.	4 min.?	Ditto.	Removal of tonsils and adenoids.

The first nine cases were quoted by Green (*Lancet*, 1906, ii, p. 1708). Only in case 9 is any note made of after-effects; in this case the patient slept for four hours and was at times delirious. She was better the next day.

As we said in a previous article dealing with this matter, it requires a considerable amount of bravery and decision for the surgeon to resort to direct heart massage. The fact, however, that there are case reports accumulating to show that it apparently saves life is worthy of remembrance when death seems imminent in the course of abdominal and other operations.

CEREBRAL SYMPTOMS AFTER NASAL OPERATIONS.

In much the same way in which a crusade against the tonsils was instituted some years ago operations upon the nasal septum have become increasingly popular and, undoubtedly, in many instances have given much relief from obstruction to normal breathing, or, what is more important, relief from obstruction to normal drainage from the various cavities in the bony structures of the face. It was said a number of years ago by Maurice Richardson of Boston that unless a good surgeon could be obtained in a given case of appendicitis it was probably better to treat a patient medically than to subject him to operation, and this statement holds with even greater force in regard to operations of a radical character either upon the nasal septum or the turbinate bodies: first, because serious damage can be done by an unskilled operator; and secondly, because such operations are not to be entered into lightly, owing to the fact that meningeal and cerebral manifestations of greater or less severity most commonly complicate convalescence. Of course, in many instances such operations are absolutely essential, not only for the purpose of relieving disagreeable symptoms, but also to prevent the meningeal and cerebral com-

plications which otherwise inevitably ensue. The point which we wish to make here is that these operations are not simple ones, either in their immediate or remote effects.

In connection with this matter we have read with interest a communication made to the *Journal of Laryngology, Rhinology, and Otology,* of London, by St. Clair Thomson, who is well known as one of the leading rhinologists in the United Kingdom. In this article he remarks that every rhinologist has had anxieties after operations in the nose, and that any decided rise of temperature, or any perversion of the patient's mentality, leads one to prepare for the worst, particularly if the operation has been done in the presence of any markedly pyogenic condition, such as sinus suppuration, when the slightest disturbance of progress in the first three days is only too apt to usher in a catastrophe. On the other hand, when the nasal disease is not markedly purulent the symptoms may be alarming and still not fatal. Thomson then proceeds to record a case of epithelioma of the left ethmoid and maxillary sinus. Nothing untoward happened during the operation, but on the next day the patient was markedly and alarmingly changed. Instead of being bright and vivacious, she was dull, inattentive, and restless. Her speech was hesitating and indistinct. Her temperature was 101.2° to 103.6° and pulse-rate 120. There were no localizing symptoms, but there was fear that meningeal infection had taken place through the sheaths of the olfactory nerve. Careful ophthalmoscopic examination led to the belief that she was undoubtedly suffering from cerebral irritation with some compression, probably due to some exudate of an edematous nature. Twenty-four hours later the patient was improved, and on the third day the temperature was normal and the cerebral symptoms had largely disappeared.

He also reports the case of a lad, which the thought of makes him shudder, for he realized that his nasal forceps were meandering in the anterior fossa of the skull, and yet no new symptoms were manifested. In another case there was malignant disease of the ethmoid. In both there was no curetting, but after plucking away a mass of growth he realized that the disease had eroded the cribriform plate and that his instrument was against the dura mater. These two cases seemed infinitely more prone to be followed by evil results than the first, and the variations presented served only to illustrate that one can never tell exactly the type of case most prone to complications. Thomson therefore points out that the cribriform plate must always be a danger zone because the dura mater is never prepared to help in rectifying a sudden slip in this area as it does by throwing up defensive breastworks on the inner side of the temporal bone, or by thickening and strengthening the dura mater when the latter is slowly invaded by a malignant growth.

THE RELATIONSHIP OF INTESTINAL DISORDERS TO EPILEPTIC SEIZURES.

It is a well-recognized fact that when a disease is difficult to treat and its causation is difficult to determine a multitude of remedies are suggested for its relief, and an even larger number of theories are brought forward to explain its origin. It is probably true that no disease known to man has been treated in as many and as varied ways as epilepsy, and the number of causes which have been assigned to it are innumerable.

Curiously enough some of the causes which a few years ago were considered so ancient as to be hoary with age have recently been rejuvenated in a more modern form. A favorite explanation for many conditions, to wit, that a given state is due to intestinal intoxication, has found many earnest advocates, and at least one enthusiastic surgeon has actually gone so far as to express the belief that the large intestine of the epileptic is the home of a microörganism which may be considered specifically responsible in a given case for the

convulsive outbreak, and, going a step further, has advocated and performed a radical abdominal operation to produce a cure.

All diseases of the nervous system which are largely connected with altered function are prone to be changed, at least for a time in their manifestations, by strain and shock, and cases of epilepsy subjected to severe operations, whether they be in the field of abdominal surgery or, as was so popular twenty or thirty years ago, in the field of cerebral surgery, are not rarely followed, if the patient survives, by a period in which the convulsive seizures are temporarily put aside. In the case of so-called idiopathic epilepsy, the causes which have so far been discovered are those which upset the balance of nerve cells already unstable, rather than the underlying or deep-seated causes of the disease itself.

In the *Boston Medical and Surgical Journal* of May 17, 1917, Caro makes a report from the Pathological Laboratory of the Monson State Hospital for Epileptics at Palmer, Mass., on the "Incidence of Intestinal Adhesions as a Factor in Chronic Intestinal Stasis in the Epilepsies." He well points out that the trend of recent research has been directed in large part away from the brain structure and toward the gastrointestinal tract and the glands of internal secretion, and the fact that constipation is so common amongst epileptics has possibly been the finger which pointed toward this change of view. Caro, therefore, to determine if there was a high percentage in relationship between intestinal adhesions and epilepsy, utilized two hundred and fifty post-mortem examinations for this purpose. He divides his cases into two groups, those in which adhesions may be considered a factor in the causation of chronic intestinal stasis, and those in which adhesions have resulted from chronic intestinal stasis. Two hundred and twelve of the autopsies failed to reveal any adhesions, and therefore it would seem evident that adhesions cannot be a very common cause of epileptic seizures. Secondly, he found that very few of the adhesions antedated the onset of the epileptic seizures, and in only four cases out of the two hundred and fifty could the symptoms of intestinal stasis due to adhesions be considered as the result of the lesion found at autopsy. In his first class, those that may be considered a factor in the causation of chronic intestinal stasis, there were twelve cases. In his second class, in which adhesions resulted from chronic intestinal stasis, there were twenty-five cases, and under a separate classification there was one case of adhesions due to hernia. Whatever may be the influence of intestinal stasis in epileptic seizures, Caro's investigations therefore indicate that adhesions are of little importance as a primary cause.

METHODS OF RESUSCITATION.

It is now generally believed that, in so far as manual methods of artificial respiration are concerned, the Schaefer is to be preferred. Meltzer (*Medical Record*, July 7, 1917), in an admirable but brief history and analysis of methods of respiration, quotes Schaefer to the effect that "if he were confronted by the task of resuscitation he would kneel astride over the subject and perform the simple motions of horseback riding without employing his hands and arms at all." Meltzer further states that this simple method of employing the prone method could be readily combined with the use of his own pharyngeal insufflation apparatus, and the operator who is performing the Schaefer method could at the same time manipulate with one hand the respiratory valve and with the other hand regulate, when necessary, the T-tube. But the operator must learn to move the ring of the valve to the left (expiration) synchronously with throwing his body downward upon the individual, and to move his thumb to the right (inspiration) simultaneously with the raising of his body from the individual.

Meltzer in his historical résumé alludes to the interesting procedure called fumiga-

tion, consisting in filling the large bowl with tobacco smoke, practiced with enthusiasm for nearly forty years; finally tabooed by the Royal Humane Society. Aside from the barrel method, artificial respiration was performed by inflation of the lung from mouth to mouth while the nose of the victim was kept closed, a method which seemed to have been long in practice in reviving the still-born, and which, in this domain, is even now in use. At the time of our Revolution the bellows method became popular. John Hunter constructed a double chamber, one for filling the lung, the other for emptying it. The bellows accepted by the Royal Humane Society had connected to it a tube which was introduced into one nostril while the other nostril, as well as the mouth, was kept closed, and the cricoid was lightly pressed backward to prevent the insufflated air from passing down into the esophagus. For forty years bellows were recommended by the Royal Humane Society; later their approval was withdrawn.

In 1903 Schaefer reported on the prone method: "The subject is placed face downward, the chest resting directly on the floor. The operator kneels astride the prone subject and places his hands over the lower ribs and the lumbar parts on each side of the spine. To produce the expiratory movement the operator, keeping his arms outstretched, brings the weight of his body on the lower dorsal region of the patient; the abdominal viscera are hereby powerfully compressed and forced against the diaphragm and lungs, which are thus brought into a position of ultra-expiration. The recoil which occurs when the operator's weight is withdrawn causes an inspiration."

As to Laborde's method of traction of the tongue, Meltzer states that although it can hardly be considered as a method of artificial respiration, there is no doubt that in some instances, especially in accidents from anesthesia, a few tractions of the tongue may reëstablish respiration. It is evident that in most of these cases the aid is rendered by lifting the epiglottis away from the entrance into the larynx. However, it is not this effect which Laborde had in mind. He states that he succeeded by his method in resuscitating from drowning even after there was no respiration for one hour. Laborde believes that the favorable effect is due to reflex action through the glossopharyngeal and other nerves. Soon after Laborde's communication there were some favorable reports from the use of this method, especially in France.

In the last seven or eight years various efforts have been made in this country to introduce mechanical resuscitating machines. Most of these efforts are to be distinguished from all foregoing activities by one deplorable characteristic: while the activities in the foregoing periods were stimulated practically solely by humanitarian and scientific intent, nearly all the apparatus and machines which are being introduced at present, and which receive a greater or less unscientific publicity, have one unpleasant feature in common, namely, the plain and unveiled commercialism which is evidently the sole motive for their construction. Their introduction to the public is accomplished by the usual methods by which commercial products try to make headway, namely, by a more or less loud advertising. It is rather a sad chapter in the history of resuscitation.

After alluding to the misleading effects of uncritical statistical data, Meltzer takes up the question of respiratory volume and notes that Schaefer found that his prone method of artificial respiration gave a much larger volume than the supine or Sylvester method; this in the normal individual. His conclusions, however, are open to criticism. In either method the respiratory volumina obtained are about one-half, or less than are obtained in normal respiration, showing that none of the methods are in a position to keep up the respiration for any length of time when the respiratory mechanism is in a state of complete failure.

Meltzer tested his method in curarized animals. The respiratory muscles, of course, being completely paralyzed if a given method of artificial respiration is inefficient, the circulation comes sooner or later to a standstill. When, however, the method is

efficient the circulation can be kept practically in a uniformly normal state for many hours, although the animal remains completely paralyzed.

Regarding the manual methods the longest maintained circulation of a curarized and anesthetized animal was twelve minutes by the Sylvester method, even when the tongue was kept pulled out by means of the forceps. By the Schaefer method, with the anterior extremities stretched forward, the longer period during which the circulation was kept going amounted to about eighteen minutes. In the latter case the movements were so energetic that the dog's liver was found to be ruptured.

As to the efficiency of the pulmotor, that of the Bureau of Mines, Meltzer has investigated on a large number of dogs, and the results deserve a more extensive statement. The pulmotor was applied by means of a mask fitted especially for each dog; the tongue was kept withdrawn. In some instances the trachea was connected with a manometer to establish the pressures during inspiration and expiration. The pulmotor is driven by the force of a specially adapted oxygen tank, the contents of which showed only 26.75 per cent oxygen. Out of a large number of dogs the circulation of only one could be maintained for one hour, the circulation stopping when they were left exclusively to the effect of the pulmotor. The manometer left in the trachea showed, as a rule, a comparatively small pressure, the utmost 40 millimeters of water. When the thorax is kept open it is observed that, practically without exception, with the continuation of the use of the pulmotor the size of the lungs gradually became smaller and smaller. When the pulmotor had been used for some time the lungs, in many cases, presented an uneven appearance—small, collapsed areas alternating with emphysematous ones. The success of the pulmotor was more satisfactory when it was connected directly with the trachea by means of a tracheotomy tube. The inefficiency of the machine seems to be caused essentially by two elements. The first element is its automatic arrangement. While the air-oxygen passes from the nasopharynx into the trachea it seems to meet with some sort of obstacle which converts prematurely the inspiratory movement into an expiratory one. The result is an insufficient exchange of respiratory gases. The second deleterious element is the suction, an element inherent to other machines on the market. Apparently in many cases the suction closes most of the bronchioles before it succeeds in removing deleterious expiratory gases from the alveoli. In these instances the air within the dead space is caused to move, which simulates respiratory movements without producing an actual exchange of gases.

In regard to intratracheal insufflation introduced seven years ago by Meltzer and Auer, the writer regards it as the most reliable method of artificial respiration. He has kept many animals for more than twenty-four hours continually under ether administered by the method of intratracheal insufflation without causing any injury to them. Several cases of poisoned human beings without any respiration, intratracheal insufflation has kept alive for more than fifteen hours until the patients recovered. The introduction of the tube into the trachea requires some dexterity and practice, and any of the apparatus now on the market used for keeping up the intratracheal insufflation is usually expensive. It is needful to simplify the method and make it available for a larger and more immediate application.

Meltzer thus describes his last modifications: There is first a foot bellows, which may be substituted by an air-oxygen tank, next the respiratory valve, a small tube which can conveniently be kept in the hand when using it; the tube has a protruding movable ring into which the thumb fits. When the thumb moves the ring to the right side the driven air or oxygen passes through the respiratory valve to the pharynx and lungs. When the ring is moved to the left side the escape from the respiratory valve is prevented and the air or oxygen accumulates meanwhile in a large bag, interpolated between the source of

pressure and the respiratory valve, while an aperture appears above the ring for the escape of the expiratory air from the lungs. The presence of the bag offers the advantage that during the expiratory phase the air or oxygen may accumulate in the bag and be ready for a full inspiratory blast as soon as the thumb moves the ring to the right side. Third, the pharyngeal tube with a flat surface at its lower side which rests on the tongue, and a curved surface on its upper side. At the pharyngeal end of the tube the upper surface is longer than the lower one. The external end of the tube has a protrusion with a neck for connection with the respiratory valve and an opening through which a stomach tube may be pushed down through the esophagus into the stomach. When no tube is in use this opening is closed. A T-tube is interpolated between the respiratory valve and the pharyngeal tube. The T-tube carries on its rubber end a clamp screw, which, when not screwed down, permits most of the air to escape through the tube, while on the other hand, by gradually screwing down the clamp upon the rubber tube the amount of air entering the pharyngeal tube will gradually increase.

This T-tube arrangement supplants the mercury valve of the earlier form of apparatus and is used with great advantage for the same purpose—that is, to prevent the harm of an excessive pressure. Next a padded wooden board is employed for compressing the abdomen by means of belts.

The rubber tubing must have thick walls so that it will not kink; metal and no glass tubes ought to be used for all other connections. All these parts ought to be kept connected and in readiness in a handy small bag. The bag should contain (1) a stomach tube which fits into the external opening of the pharyngeal tube; (2) an appropriate tongue forceps; (3) a roll of tape and a pair of scissors. Bellows, rubber tubing, etc., should be frequently examined for their efficient activity, in order that the apparatus will not fail when its application is needed in an emergency.

The technique of application is as follows: First, the application of the abdominal board—in order to prevent the entrance of the insufflated air into the stomach and the intestines. Second, to pull out the tongue as far as possible by means of the forceps. Third, to insert the pharyngeal tube of the readily connected apparatus as deeply into the pharynx as possible with the flat side of the tube on the tongue. The tongue should now be tied to the tube by means of tape—not too tight. The tying of the tongue has two purposes: (1) It prevents the falling back of the posterior end of the tongue and of the glottis, and (2) it keeps the pharyngeal tube in place. The working of the bellows with one foot, and the moving of the ring of the respiratory valve with the thumb of the right hand, should be started immediately on tying the tongue to the pharyngeal tube. At the beginning of the procedure the T-tube should be kept open; it should soon be gradually screwed down until the thorax shows a distinct raising when turning the ring to the right, and falling when turning to the left. The heaving of the chest need not be too strong. The degree of the heaving can be readily controlled by means of the screw, which should be turned down gradually, and which will then be capable of accomplishing all the good which may be obtained from the use of a mercurial valve. Moving of the ring thirteen to fifteen times per minute will give a satisfactory respiration; or the operator may time the moving of the thumb by the rhythm of his own respirations. In case of need one individual who has had some training may accomplish all three procedures and start the artificial respiration in less than one minute after finding the victim.

Should the respiratory failure take place while the abdomen is open, a condition in which the abdominal board cannot be applied, the plate at the outer end of the pharyngeal tube should be opened and the stomach tube pushed through the opening into the stomach; any surplus of air which may enter into the stomach will thus promptly escape through the stomach tube. This device has been tested on many

paralyzed animals, and it was found thoroughly capable of properly supporting the function of respiration. The insertion of the stomach tube may be used even where the abdominal board is being applied; in fact it may be saving time by introducing the stomach tube immediately on inserting the pharyngeal tube; the application of the abdominal board may be carried out later with greater leisure. On the other hand, the application of the abdominal board has the further advantage that it drives a part of the blood contained in the splanchnic region into the heart and thus supports to a degree the failing circulation.

The size of the pharyngeal tube which goes with the apparatus is generally sufficient to prevent too much of an escape of the insufflated air through the mouth; furthermore, the prolongation of the curved side of the tube raises the soft palate and thus prevents the escape of air through the nose. However, we need not care about slight escapes of air, since the amount of inflated air can be easily controlled by means of the T-tube and the clamp screw. Meltzer recommends this form of artificial respiration only in emergency cases.

On the circulatory side of the question massage is sometimes an invaluable procedure in restoring the heart's action. Experimentally the administration of adrenalin by the intravenous or intracarotid method has seemed helpful. The compression of the abdomen, as employed in Meltzer's artificial respiration, drives a part of the blood from the splanchnic region into the heart and from there into the general circulation. Experimentally it is capable of increasing the blood-pressure from 20 to 30 mm. of mercury. The application of heat, friction, the mechanical and chemical stimulations of the mucous membrane of the nose, may sometimes render contributory service. Stimulation of the pudic regions or of the soles of the feet frequently exerts an effect upon the respiration, if the respiratory mechanism is not entirely paralyzed.

All first-aid men must be impressed with the fact that their first attention must be given to the respiration; it is not necessary to impress them that all the other means have no value. The laboratory studies concerning artificial respiration seem very complete. The failure of clinical observation to always corroborate is largely due to the inaccuracy of such observation. At one time current literature was flooded with reports of successful cases treated by the Laborde method of traction of the tongue, implying necessarily preservation of the reflex. It is to be noted that Keith, quoted by Meltzer, who collected the statistics from 1785 to 1911, when warmth and bellows were used, reports that 54.8 per cent of cases were unsuccessful; whilst in 1832 to 1851, when warmth and friction were used, there were only 10 per cent of unsuccessful cases.

Those who have seen the various mechanical devices put upon the market and provided with valves and a face-mask in actual use in the time of emergency have been somewhat strongly impressed with their power for evil as well as for good. The physiologically entirely inadequate methods of Sylvester and Schaefer have apparently yielded hundreds of successes. As opposed to the scientific proof that neither of these methods is able to sustain life for more than ten minutes unless they be associated with respiratory movements, it is quite true that they have been successful after many hours of no apparent breathing upon the part of the patient. None the less insufflation by simple non-traumatizing apparatus would theoretically commend itself and clinically has proven its superiority.

REPORTS ON THERAPEUTIC PROGRESS.

THE LEUCOCYTE COUNT AS A GUIDE TO TREATMENT OF WOUNDS.

The *British Medical Journal* of April 7, 1917, quotes Stabsarzt Lindemann (Bruns, Kriegschrift, Heft 24, p. 608), who has drawn attention to the great practical value of the leucocyte curve as an indication for surgical interference in gunshot wounds. In such wounds the initial infection was combated in the body with a twofold result. On the one hand, where resistance was good, the activity of the infection was suppressed either permanently or for a varying period—latent infection. On the other hand, where resistance was weak, the activity of the infection persisted—manifest infection. The treatment, conservative or active, to be adopted depended on the early recognition of the nature of the infection, whether latent or manifest. As an illustration, two cases of gunshot fracture are described in which an immediate operation was performed for removal of fragments; in both there was a similar rise in temperature and pulse frequency; subsequently in the one case a suppression of the active infection, in the other its continuance, necessitating another operation.

The clinical discrimination between such cases involved a loss of several days, and Lindemann claims that this could be avoided by making use of the leucocyte curve. For this purpose it was necessary that there should be a daily record, the curve being most conveniently plotted on the temperature chart. The initial leucocytosis was extremely rapid, and was completed within a few hours from the wounding, the leucocytes increasing two to fourfold. During the next twenty-four hours the leucocytes as rapidly diminished, becoming normal, or almost normal, in number. If the infection had been rendered latent by this reaction no further increase took place. If, on the other hand, the infection proved to be manifest, a second sudden or gradual leucocytosis occurred. Lindemann embodied these conclusions, which were based on a study of his cases, in four types of leucocyte curve:

(*a*) Typical of latent infection. First count four hours after wounding; high leucocytosis (34,000). A few hours later almost normal; further course normal.

(*b*) Typical of latent infection, but first count twenty-four hours after wounding. No leucocytosis.

(*c*) Manifest infection. First count two and a half hours after wounding. High leucocytosis (30,000). After a few hours a fall almost to normal, with, in the next twelve to thirty-six hours, a second rise, persisting until operative interference; then fall to normal.

(*d*) Manifest infection, but first count twenty-four hours after wounding. No leucocytosis (the initial rise and fall not having been registered); a few hours later a sudden rise in the curve, persisting till relief by operation.

The indications deducible from these curves were as follows: High leucocytosis at first denoted the initial reaction; its rapid fall to the normal without further rise indicated conservative treatment. Low leucocytosis on the second day did not denote the absence of manifest infection. A steep rise on the second day strongly suggested a manifest infection; and its continuance confirmed it. A relatively low leucocyte count in spite of the presence of a manifest infection denoted a comparatively non-virulent infection.

THE TREATMENT OF DIABETES MELLITUS.

In the *Lancet* of April 28, 1917, WILLIAMSON states that the following is a brief sketch of the line of treatment which he has carried out with much success in many cases of diabetes mellitus during the last three years. Recently many new methods of treatment have been published, some of which are of distinct service. Certain of these methods, however, have disadvantages,

and are occasionally followed by unpleasant symptoms. The line of treatment briefly sketched in this article will, he thinks, be found free from risk if carried out in the class of cases indicated. (To limit the length of this article many of the details of the treatment have been omitted.)

A routine examination of the patient is first made, complications noted, and the abnormalities of the urine determined. When certain complications (affections of the lungs, heart, kidneys, etc.) are detected a special form of treatment may be required and a rigid diabetic diet may not be desirable. Such cases are not considered in this article.

When the case is one of diabetes without these complications a diabetic diet will be usually suitable. But the form of the disease must first be determined. When the urine gives persistently a claret coloration with perchloride of iron, and if this is not due to drugs, and if other indications of decided acidosis can be detected, the case requires very careful and special treatment. These cases will be briefly considered at the end of this article.

If, then, no complications can be detected which require a special form of treatment, and if the urine should give no reaction with perchloride of iron, and no other signs of decided acidosis can be detected, the following course of treatment may be carried out:

1. The patient is first placed on Diet I—an ordinary rigid diabetic diet, but with the addition of three ounces of white bread daily.

2. If the glycosuria is not checked in a short time (few days) the white bread is promptly replaced by a pure diabetic bread (free from starch, or only containing the smallest amount thereof), such as biogene bread and ponos biscuits, protein bread, etc.—Diet II.

3. If this fails after a fair trial of 10 or 14 days the following—Diet III—is often successful if the patient is able to rest at home on a sofa for a short time:

For one week only food is taken in small quantities every two hours from 8 A.M to 10 P.M., and the foods are eggs, milk, cream, custard, coffee, tea, and beef tea. The following is the diet sheet:

8 A.M.: Tea or coffee with one tablespoonful of cream. One egg (poached, buttered, or boiled).

10 A.M.: One glass of warm milk (10 ozs.).

12 noon: Custard unsweetened (containing one egg and half a pint of milk).

2 P.M.: One glass of warm milk (10 ozs.) or cream (1 oz.) in warm water (10 ozs.).

4 P.M.: Tea with one tablespoonful of cream; one egg (poached, buttered, or boiled).

6 P.M.: Cream (1 oz.) in 10 ozs. of warm beef tea.

8 P.M.: One glass of warm milk (10 ozs.).

10 P.M.: Cream (1 oz.) in warm beef tea.

In this diet (or in the modification following) the patient received daily 3 or 4 eggs, 2 to 3 ounces of cream, 2 pints of milk, in addition to tea, coffee, and beef tea.

The various small meals may be changed in order or altered if the patient desires. Thus, at 2 P.M. cream and beef tea may be taken in place of milk, and a glass of milk at 6 P.M. in place of cream and beef tea. At 8 P.M. one egg beaten up and added to 10 ounces of warm beef tea may be taken in place of the glass of milk, or a poached egg and half a pint of beef tea if the patient prefers. At 10 a glass of milk may be taken in place of cream and beef tea. Also, if the patient prefers, an egg (poached or boiled) and a glass of milk may be taken at 12 in place of custard.

This diet often checks the glycosuria in a few days or by the end of the week. If the glycosuria is not checked by the end of the week the diet may be continued for a few days longer; but if it then fails it should be discontinued and the patient placed back on Diet II for a few days. If Diet III has failed to check the glycosuria the patient may be placed on Diet IV of casein or biogene and cream.

4. Diet IV of casein or biogene and cream.

The patient is given for seven or ten days a glass of casein or biogene and cream with water every two hours from 8 A.M to 10 P.M. The casein preparation lait-proto No. 6 will probably be the most satisfactory for the majority of patients. A cup of tea or beef tea, or both, may be also taken, if the patient desires, twice a day.

The mixture of casein and cream and water is prepared as follows: One tablespoonful of casein, or lait-proto No. 6; one tablespoonful of cream; mix well in a tumbler with a spoon, then add hot water (or cold if preferred) very gradually, mixing well until the tumbler is full. (The fluid may be sweetened with saccharin or flavored with nutmeg if desired.)

In place of one tablespoonful of casein two tablespoonfuls of biogene may be used if the patient does not like the taste of the casein. It should be mixed with two tablespoonfuls of cream and the water added as just described.

Many patients take the casein or biogene quite well, others find both unpalatable, and some cannot take either. Lait-proto No. 6 may be taken quite well when ordinary casein or biogene cannot be taken.

If we wish to avoid using diabetic breads instead of following the order just indicated the trial of Diet II may be omitted, and if Diet I fails Diet III may be tried at once; or if the patient likes the taste of casein or biogene, and can be seen daily, Diet IV may be tried before Diet III (at once after Diet I).

Williamson has found Diet III (eggs, cream, milk, beef tea, etc., as indicated) of very great success; it is simple, palatable, and often very successful. It can be taken by nearly all patients and it is less expensive than diabetic food. It can be usually taken quite well by patients who cannot take casein or biogene. It is very useful in the case of diabetic children. It is often very successful both in mild cases and cases of medium severity, and sometimes in severe cases. In some cases, like all other treatment, it fails. It often removes the glycosuria promptly in a few days or a week, though an ordinary rigid diabetic diet had previously failed. After taking this diet for seven or ten days often the patient may then take ordinary rigid diet for a long period without glycosuria returning, though previously on such a diet the glycosuria had continued. Probably it is not so often successful as the treatment with casein or biogene, but if it fails the latter treatment may then be tried, or a combination of the two methods. Diet III or IV should be continued for seven or ten days only. They are to be regarded as methods of dietetic treatment which are usually much more successful than an ordinary rigid diabetic diet in removing the glycosuria temporarily, and the after-effects probably continue longer. If later the sugar returns in the urine the methods may be repeated. Diet IV may be successful when Diets II and III have failed. In a few cases with persistent diacetic acid reaction in the urine Diet III or IV removes the diacetic acid as well as the sugar, but is not always suitable in such cases.

After Diet III or IV has been tried for seven or ten days the patient is placed back on Diet II if the glycosuria continues. If the glycosuria has been checked, then the Diet III or IV is gradually changed. One ponos biscuit is allowed at 8 A.M. and 4 P.M. with the egg and tea. One or two days later bacon and green vegetables and custard are allowed at 1, in place of the meals at 12 and 2, and later Diet V and then Diet II are allowed.

Of course, the Diets III and IV will not be successful in all cases, but they are always worthy of a careful trial, except when the urine persistently gives a marked claret coloration with perchloride of iron. In these cases caution is necessary, and sometimes Diets III and IV are not advisable.

5. If all the diets already described have failed to check the glycosuria, then for a short time a diet of suitable vegetables, eggs, and fatty foods may be tried (Diet V).

Breakfast: Coffee (or tea) with cream; eggs (buttered, poached, or boiled), or tomatoes or mushrooms; suitable diabetic bread or biscuits; butter. Dinner: Bacon

cooked in any way. Any of the following vegetables: cabbage, cauliflower, Brussels sprouts, turnips, French beans, spinach, broccoli, boiled walnuts, asparagus, vegetable marrow, tomatoes, mushrooms, salad, lettuce, cucumber, watercress, celery, radishes; custard; suitable diabetic biscuits or bread. Tea or evening meal: Tea and cream; eggs (buttered, poached or boiled); or Welsh rarebit, cheese; or salad, lettuce, cucumber, mushrooms, tomatoes, boiled egg and spinach, watercress; suitable diabetic bread; butter. Or the following diet may be tried for a short time:

Breakfast: Tea or coffee with cream; one egg and tomatoes or mushrooms or spinach; also one ponos biscuit or other similar biscuit. At 11 A.M.: Two tablespoonfuls of cream in half a pint of warm beef tea. Dinner (12.30 or 1): Beef or tomato soup or one sardine and one ponos biscuit. Afterwards one or more of the following vegetables: cabbage, cauliflower, Brussels sprouts, vegetable marrow, broccoli (curly green), boiled celery, asparagus, French beans, turnips, tomatoes, mushrooms, boiled walnuts, Brazil nuts sliced and fried in butter; custard; stewed rhubarb, gooseberries, or cranberries with cream. Tea (4 to 5): Tea with cream, tomatoes or asparagus or celery or mushrooms, lettuce, salad, cucumber, jelly; one ponos biscuit. Supper: Beef tea and cream (as at 11).

6. If these diets fail to check the glycosuria then drugs may be tried. The drugs which Williamson has found most useful are: sodium salicylate, aspirin, and salicylate of quinine. These drugs may be given along with Diet II, or I, or V. Williamson has been able to demonstrate clearly the distinct effect of sodium salicylate and of aspirin in diminishing the glycosuria in certain cases of the milder form of diabetes, and also in cases of medium severity. Some patients take sodium salicylate better, others aspirin.

The dose of these drugs has usually to be increased to 15 grs. (or more) four times a day before definite effects are obtained, and a careful watch should be kept for toxic symptoms. It is better to use the natural salicylate. In certain cases salicylate of quinine, grs. 3 or 4 or more, three or four times a day, has appeared to be of distinct service, though Williamson has not been able to clearly demonstrate this by careful hospital observations, as in the case of the two drugs just named.

7. Fast days are sometimes of service. On these days the patient fasts, and takes only tea or coffee, beef tea, or whisky-and-soda several times, and no other food. In the less severe cases the glycosuria ceases on these days, but it often returns in a day or two. It may, however, not return for many days, and occasionally for a considerable time it is much less than before the fast days. But very often Williamson has found the results of little permanent value. A fast day once a week is useful in some cases, but he much prefers the treatment with the two-hourly fluid diets III and IV, described in this article. He also prefers these diets to the more prolonged fasting which is being so frequently carried out.

When the patient suffers from insomnia or marked neurasthenia bromide of potassium (grs. 30 at night, or 30 early in the evening and 30 late at night) is suitable. Overwork, mental strain, and worry often increase the glycosuria, and should be avoided as much as possible.

If none of these diets or treatments check the glycosuria, then we must be content if we can diminish it by the various treatments described. After a time it is well to allow a small amount of white bread or milk, or both, especially if the urine should give a persistent reaction with perchloride of iron.

In some cases the most careful treatment fails; in others it is successful for a shorter or longer period and then fails. But in some cases it is successful for many years, or even to the end of life.

If we have checked the glycosuria by diet or drugs, then Diet II may be allowed, and later Diet I. Still later more white bread is cautiously allowed, and then other starchy carbohydrates, if no glycosuria returns. But it is always advisable permanently to forbid sugar and sweet foods containing sugar. The urine should be watched

and the diet made more rigid if glycosuria returns, and less rigid when the glycosuria ceases. In this way it is possible in some cases to keep the glycosuria in check for many years, or occasionally until the patient reaches advanced age and dies of some other disease.

RECENT RESULTS IN THE SERUM TREATMENT OF CEREBRO-SPINAL FEVER.

Robb in the *British Medical Journal* of April 14, 1917, in summing up his conclusions in a long article says that all the recent work in cerebrospinal fever goes further to prove that the most hopeful line of treatment is by lumbar puncture, drainage, and the intrathecal injection of carefully prepared polyvalent antimeningitis serum; and that the most important factors which make for success are early treatment and sufficient dosage.

TREATMENT OF CASES OF ACUTE POLIOMYELITIS DURING 1916.

Peabody in the *Boston Medical and Surgical Journal* of May 3, 1917, tells us that of the 123 cases of poliomyelitis seen, 54 were first visited in the preparalytic stage, 65 were recently paralyzed cases, and four were cases of old paralysis. Of the total of 54 preparalytic cases seen, 51 were treated with immune serum. Two of the untreated cases were apparently of the abortive type of the disease, and it was considered unnecessary to give them any injection. Of the 51 cases treated with intraspinal injections of immune serum, 35, or 69 per cent, recovered without paralysis; 11, or 21 per cent, recovered with paralysis; and 5, or 10 per cent, died. In the 11 paralyzed cases the results were slight in six.

Sixty-nine paralyzed cases were seen. Of these four had had the disease a long time before they were seen, and 65 had been recently paralyzed. Of the latter cases 60 were treated with immune serum. It is rather difficult to form any accurate conception as to whether cases in this group improved or did not improve as a result of treatment, but a rough classification indicates that 8, or 12 per cent, showed definite rapid improvement, while 33, or 51 per cent, did not improve much after the injection of the serum, or became worse. Twenty-one cases, or 32 per cent, died, and in three cases, or 5 per cent, the result is unknown. In the total of 123 cases there were 26 deaths, giving a mortality of 21 per cent. This is just about the average mortality of the epidemic.

In discussing the effect of treatment by means of intraspinal injection of immune serum it seems wise to disregard the cases which were already paralyzed when treatment was administered. One could hardly expect any definite improvement after the spinal cord was already involved sufficiently to cause a peripheral paralysis, but it was hoped that the progress of the disease might be stopped. Whether such a result was occasionally obtained or whether the cessation of the spreading of paralysis was always spontaneous, it is, of course, impossible to determine accurately.

The results of treatment in the cases seen in the preparalytic stage of the disease are at first sight rather encouraging, and the number of patients is large enough to allow the drawing of fairly definite conclusions. The mortality was 10 per cent, which is only one-half of the general mortality of the epidemic. The majority of the fatal cases were, moreover, acute fulminating instances of the disease, and it is hardly conceivable that any method of treatment could have been of value. Only 21 per cent of the cases (excluding the fatal cases) became paralyzed at all, and in more than one-half of these the paralysis was extremely mild. Of most importance, however, is the group of patients in whom no evidence of paralysis appeared. This includes 69 per cent of the total number of cases seen in the preparalytic stage. The result is apparently very gratifying, but a critical consideration requires a comparison with the outcome of a similar group of untreated cases. The necessary data for control are not available from their own

experience, but Dr. George Draper of New York has been kind enough to put at their disposal some of the results as yet unpublished, obtained by him in the study of the present epidemic in Long Island. According to these statistics of 85 preparalytic cases, in which the diagnosis was proved by lumbar puncture, and in which no serum was administered, 48, or 56 per cent, developed no paralysis. The results in Peabody's serum cases were thus about 10 per cent better than were the results in Draper's untreated cases, but in the consideration of the effect of a therapeutic measure in so variable a clinical condition as acute poliomyelitis, such a difference must be regarded with great conservatism. It is, however, also of interest to note the results of the administration of serum by other workers. Zingher reports that of 54 cases treated in the preparalytic stage, 44, or 82 per cent, did not become paralyzed. Twenty-five of these patients were seen at the Willard Parker Hospital, and of this group 24, or 96 per cent, did not become paralyzed. Zingher also reports that 9 out of 10 cases treated intraspinally with normal human serum failed to develop paralysis. Amoss and Chesney treated 14 cases in the preparalytic stage of the disease by intraspinal and intravenous or subcutaneous injections of immune serum. Two of these died, 2 developed slight paralysis, and 10, or 71 per cent, remained unparalyzed. The best results were obtained in the patients who were treated earliest (within 48 hours of the onset), and who received the largest amounts of serum (over 30 Cc.), both intraspinally and intravenously and subcutaneously. The considerable variation in the results obtained by different workers in the administration of immune serum may be due in part to differences in technique, but no doubt the character and number of cases studied are an important element. None of these series is as large as it should be when one considers the great variation in the clinical course of the disease under consideration. For the proper interpretation of the results of treatment it is essential that we should have a much more complete knowledge of the natural history of the disease. At the present time we have only an imperfect idea as to what proportion of persons affected with the disease become paralyzed even if no treatment is instituted. Nevertheless there is apparently a general agreement among those who have used the immune serum as to its harmlessness, and as to the fact that in certain, possibly in numerous, instances its administration is beneficial.

While the results obtained in the treatment of acute cases of infantile paralysis by the intraspinal injection of immune serum have been somewhat less satisfactory than might have been hoped, it is of some importance that this community has had its own experience with what has seemed to be the most promising method of treating the disease. There is evidence in favor of the use of serum in the preparalytic stage, but its administration in paralyzed cases, except where the disease is progressing, should probably be avoided, for it is quite possible that further harm might be done to the spinal cord by increasing the pressure in the spinal canal. It is also probable that in any further work with the treatment of the disease the intravenous injection of serum in very early cases should be taken up.

The work on the diagnosis of poliomyelitis with the aid of the examination of the spinal fluid has been of considerable importance. In all early cases the examination of the spinal fluid has shown evidence of a meningitis, and the cell count has ranged from 34 to 1980 per Cc. in the preparalytic stage. In general the more severely affected patients have shown the higher cell counts, but this is not at all a constant finding. In the earliest stages of the disease about 40 to 90 per cent of the cells in the spinal fluid are of the polymorphonuclear type, and with the progress of the disease the mononuclear cells tend to predominate. In general, the cell count, which is done rapidly and easily, has proved to be the most satisfactory method of making a diagnosis in preparalytic cases of infantile paralysis. Although the clinical

picture of the acute stage of the disease is fairly typical, so that a physician who has seen a number of cases is often able to make the diagnosis, nevertheless any confirmatory evidence is of great assistance. Such evidence the examination of the spinal fluid seems to provide.

Of great importance, as indicating the value of the examination of the spinal fluid as a diagnostic measure in acute poliomyelitis, are the results obtained from the lumbar puncture of cases which proved subsequently not to be infantile paralysis. This spinal fluid was examined in 31 such cases. In two instances a cell count of 12 and 15 respectively was obtained, and in all other instances the cell count was below 10. This evidence is of great importance as showing that in the febrile, gastrointestinal, and other conditions most likely to be confused with infantile paralysis the spinal fluid is almost always normal. All their cases were followed in such a way that there is no reason for them to believe that the diagnosis of infantile paralysis was made in cases in which it was not justified. There is, however, a certain source of error in that some of the so-called abortive cases may never develop to the stage of involvement of the nervous system. Draper's results make this quite probable.

MOUTH-WASHES IN HEALTH AND DISEASE.

To the *British Medical Journal* of April 14, 1917, HELEN P. GOODRICH reports on experiments made with pure and mixed cultures of organisms from pyorrhea pockets and containing, among other bacteria, streptococcus, pneumococcus, pneumobacillus, staphylococcus, and B. coli. It is not desirable here, however, to go into details as to specificity of the antiseptics, especially as their actions *in vivo* are, of course, liable to be different from their actions *in vitro*. All that she wishes to point out is that in every case there was a growth from the control and almost as invariably none after the action of a saturated thymol solution for half a minute or more (one or two exceptions being attributed to the presence of spore-forming bacteria). After only a quarter of a minute's action of the thymol there were always two or three colonies. This record was not attained by any other liquid tested except 2-per-cent chloramine-T and dilute iodine solutions, which are unsuitable as mouth-washes for general use, as will be explained below.

These experiments show that a saturated aqueous solution of thymol is a very good antiseptic for ordinary mouth bacteria, and it is the most satisfactory mouth-wash that Goodrich has been able to find. In the cases kept under observation (some for more than a year) in which this solution has been used at least every night, the growth of leptothrix, as well as the bacteria which can easily be cultivated artificially, has been very much diminished, so that there is practically no accumulation of tartar. In cases of pyorrhea in which the gums are too sore for even a soft brush to be used, they should be massaged with the fingers and then well washed with the solution, some of which should be retained in contact with the gums for some minutes. An antiseptic solution is much to be preferred to a paste or powder. These latter, owing to the necessary presence of some gritty substance, such as chalk, tend not only to injure the gums but also to clog the "pockets"—a most undesirable result.

The saturated solution of thymol has a pleasant taste, causing a temporary burning sensation, and stimulating a flow of saliva. It is a stronger antiseptic and less irritating than carbolic acid, to which it is closely related, being also a monohydric phenol. It is not acid, and is free from the corrosive action of phenol. It may be used as a gargle as well as a mouth-wash, since it is harmless if swallowed, large doses being sometimes given as an intestinal antiseptic. According to most standard works on organic chemistry and pharmacology, one part of thymol dissolves in 1500 of cold water (others give the solubility as 1:1200 or even 1:1000). According to the first, a saturated solution would contain only 0.6 per cent of thymol. Notwithstanding this

it is a remarkably good antiseptic, a fact which has, of course, long been known, though practically no use has been made of it by the general public. For ordinary use a saturated solution may easily be prepared by putting a lump of thymol into a bottle of cold or warm tap water; the water must not be hot, for thymol melts at 51.5° C. It should be allowed to stand for some hours, and should preferably be shaken occasionally. As the solution is used, the bottle may be filled up with water.

According to the solubility (1:1500) given above one gramme of thymol is enough to make 1½ liters of solution, or 1 ounce as much as 9 gallons. In 1914 the price of pure thymol was 8d. an ounce. Owing presumably to the fact that its extraction from the common wild thyme is not carried out in this country the price of it just now is abnormally high. Still, even at the present price of thymol (3s. 6d. an ounce), the cost would be less than 5d. a gallon. Such a mouth-wash should be within the reach of every one. As a matter of fact, thymol forms the active part of many dentifrices or mouth-washes. One dentifrice tested gave quite good results, and was found to contain a saturated solution of thymol according to the prescription on the label. All of these proprietary mouth-washes are sold at approximately 5s. a pint. In traveling, and especially on active service, nothing more convenient as a dentifrice or mouth-wash can be imagined than a lump of thymol in a small bottle to be filled with water as occasion offers. If more generally used it would put an end to the distressing gingivitis and pyorrhea so often following neglect of the teeth during a sojourn in the trenches.

Thymol is much more soluble in glycerin than in water (1 part dissolves in 190 glycerin), so that if glycerin be added to the tap water used a stronger solution of thymol may be obtained, without, however, increasing its antiseptic power. The presence of glycerin may be desirable, and of course the solution can always be diluted with more water should it be found to be irritating. As a general rule the aqueous solution, undiluted, will be found to be a suitable strength. There are no official preparations in the British Pharmacopœia, but several non-official ones are used to some extent—for example:

Liquor thymol: 1 part thymol in 100 parts 90-per-cent alcohol, the resulting solution to be diluted in the proportion of ½ pint to a gallon. This gives the final concentration of thymol as 1 in 1700, or 0.058 per cent. This preparation therefore contains slightly less thymol than a saturated aqueous solution (0.06 per cent, taking the lowest solubility 1:1500). Experiments showed that a saturated solution of thymol had more effect in one minute than a half-saturated one had in four minutes (inverse squares of concentrations). It is therefore very necessary to have the solution as concentrated as possible—that is to say, saturated.

Boracic acid has given disappointing results. A saturated solution must act for more than two minutes to be effective, and was by no means always satisfactory in five minutes. If used, care should be taken to obtain a really saturated solution by leaving excess of the crystals or powder in contact with the water until no more will dissolve. Such a saturated solution contains 4 per cent of boracic acid; by adding glycerin to the water more may be made to dissolve, but the antiseptic power of the solution is still unsatisfactory.

Unfortunately Bass and Johns, believing the ameba of the mouth (E. gingivalis) to be the cause of pyorrhea, recommended the use of a dilute solution of emetine as a mouth-wash.

E. gingivalis is certainly not the cause of pyorrhea, and is quite easily killed by ordinary antiseptics so long as it is not sheltered too much by large accumulations of tartar, into which, as already explained, it tends to burrow. Thymol solutions kill the ameba very rapidly. The well-known amebicidal properties of emetine are due to indirect action on the parasite, and yet one still finds preparations with emetine, or ipecacuanha containing it, prescribed for direct use in the mouth. The uselessness of this drug

for the purpose is well shown by experiments *in vitro*. On several occasions Goodrich has kept E. gingivalis under observation in 1-per-cent and 0.5-per-cent solutions of emetine, and found specimens alive and putting out pseudopodia after twenty to forty minutes. Consequently solutions many thousand times more dilute, such as those recommended by Bass and Johns, could hardly have any effective action during the few minutes they are likely to be retained in the mouth. Strong solutions could not be used owing to the great toxicity of emetine. As an ordinary germicide emetine gave very poor results, even in a 1-per-cent solution, being no better than a saturated solution of boracic acid.

Harmine hydrochloride was tested in the first place for its action on amebæ at the suggestion of Captain Gunn. A 0.5-per-cent solution was found to have a much greater amebicidal action *in vitro*, the amebæ being killed instantly, but the germicidal effect was approximately the same as the 1-per-cent solution of emetine. The poisonous character of this alkaloid, however, apart from other reasons, makes it undesirable for general use in the mouth.

Even in such weak solutions as 1 in 3000 iodine is a splendid antiseptic, but its destructive action on the tissues is well known, and it would obviously not make a satisfactory mouth-wash for general use. It is, however, useful to dental practitioners, not only owing to its antiseptic properties, but because it stains the leptothrix and so facilitates its removal.

Even if hypochlorite solutions do not attack the teeth, as is claimed, they are still not suitable for general use owing to their instability.

Chloramine-T (toluene sodium sulphochloramide), which has given such good results when used in solution as a spray for the nasopharynx of meningococcus carriers, was tested in 2-per-cent and 3-per-cent solutions. No growth occurred after submitting films of mouth bacteria to them for any time over fifteen seconds. However, the solutions have an unpleasant chlorinous taste, and this, in addition to possible action on the teeth and their stoppings, at present makes their general use undesirable.

Hydrogen peroxide solutions are too readily reduced to be successful in the hands of an ordinary patient. Potassium permanganate, another oxidizing agent and deodorant, is sometimes used as a mouth-wash. It is by no means ideal, being only a weak antiseptic, and, in addition to staining the teeth, has an unpleasant taste.

Zinc sulphocarbolate (zinc phenol parasulphonate) has been recently recommended to be used in 4-per-cent solution as a "gum-wash" in cases of pyorrhea. In Goodrich's experiments she has used chiefly a 10-per-cent solution, and out of nine bacterial films submitted to this strong solution for half to two minutes, she has never once obtained complete sterility. In most there were more colonies than thirteen.

Flavine and other dyes with antiseptic properties are obviously unsuitable for general use in the mouth owing to their tinctorial qualities.

To sum up: in health, as well as in cases of oral disease, antiseptic mouth-washes should be used as often as possible, and a really satisfactory mouth-wash, both cheap and effective, is a saturated aqueous solution of thymol.

THE EFFECT OF ANESTHESIA AND OPERATION ON KIDNEY FUNCTION AS SHOWN BY THE PHENOLSULPHONEPHTHALEIN TEST AND URINARY ANALYSIS.

To the *American Journal of the Medical Sciences* for June, 1917, COLP contributes a paper in which he says that upon the whole the average case, thirty-six hours after operation, shows very little change in kidney function as demonstrated by the phenolsulphonephthalein test, although 25 per cent showed urinary changes, which in ten days' time were again negative.

The functional activity of the kidney is depressed as the length of anesthesia is increased, while in short anesthesias the kidney might even appear to be stimulated to a slight degree.

As age increases the threshold activity of the kidney is lessened.

Nervous patients, anemic, obese, and arteriosclerotic patients as a rule, show some effect of their physical or psychic state on kidney function.

Preëxisting conditions of albuminuria have a tendency to decreased phthalein excretion, and those cases which have a decreased phthalein excretion, in the majority of instances, show effects of kidney depression as evidenced by careful urinary analysis, although these effects are only temporary.

For long anesthesias and apparently for nervous patients, gas and oxygen as an anesthetic seem to have the least irritating effect on kidney function, as demonstrated by urine examinations.

SACROILIAC STRAIN.

Baer in the *Bulletin of the Johns Hopkins Hospital* for May, 1917, points out that the treatment which must be instituted to effect a cure in cases of sacroiliac strain varies according to the severity, and to the type of case under treatment.

In those cases in which the sacrum is tilted forward, and the pronounced feature is a hollow back, the main principle is to relieve the anterior pulling strain by applying proper support, particularly to relieve the weakened abdominal muscles, and to correct as far as possible the visceroptosis.

In girls and women this can be done by a properly fitting corset, so padded as to support the relaxed stomach and to hold up the floating kidneys. Two extra steels should be incorporated in the corset, on either side of the midline in the back. These steels should not conform accurately to the lumbar lordosis, but tend to diminish it.

Massage and exercises should be given to the spinal and abdominal muscles, so as to increase their power and so relieve the sacroiliac ligaments of a portion of the strain. It is needless to say that, when the strain is produced by any intrapelvic condition, it should be remedied by proper gynecological interference.

In cases of this class in men, when the strain is caused by a pendulous abdomen, a proper brace supporting the lower part of the abdomen is of the greatest service.

In those cases in which the sacrum is tilted backward and we have the so-called flat back, the treatment is either supporting or manipulatory, according to the severity and the chronicity of the particular case.

In acute but mild cases, both in men and women, the greatest possible relief is given by properly strapping the back. An adhesive strap should be placed going across the buttocks, after the buttocks have been thoroughly compressed—preferably by an assistant—from one trochanter to the other. These straps should be only about three inches in their perpendicular width, and should be placed opposite the third sacral segment. Care must be taken that the straps are kept well below the crest of the ilium. They should not extend in front of the trochanters. This will relieve the mild acute forms of the affection.

In cases of more chronic type, a more permanent brace should be worn for several months. In males this can be done by a surcingle belt, made of buckskin, about 2½ inches in width, which should firmly encircle the pelvis, on a level with the third sacral segment. In cases of males with a large and fatty abdomen, a brace similar to that described for cases when the sacrum is tilted forward may be used with much benefit.

In women the corset may be utilized as a support for a webbing belt which is to go around the pelvis; or a sacral pad, made of steel and padded, which gives pressure over the sacrum by its steel prolongations, may be incorporated into the corset.

In those cases in which the sacrum is tilted backward—both in males and females —which have resisted these mild measures, or in severe cases in which the pain is very great, the manipulatory treatment is the method *par excellence*. It is to this method that Baer wishes particularly to call attention.

We all know of cases of so-called sciatica, painful in the extreme, which have re-

sisted all therapeutic and surgical treatment for months and months, and cases of chronic invalidism, with constant pain in the thigh and an associated limp. Or we have seen big, strong, healthy men, hardly able to drag themselves into the office or clinic, so great is the pain and disability. These are the cases which respond immediately to manipulation, to the delight of the operator and to the joy of the patient. Baer has manipulated 100 of these cases, with immediate relief in almost every case, and with a relapse in only three. The procedure is as follows:

The patient is placed on a low, nonmovable table, flat on his back, and then anesthetized. The anesthetization should be carried to the point of complete relaxation of all muscular tissue, for the force to be exerted at times is great and muscular rigidity carries with it some danger to the patient.

While an assistant holds the pelvis firmly, the operator grasps the calf of the leg and flexes the fully extended limb. The hamstring muscles are found to be in a state of spasm. They are attached to the tuberosity of the ischium at their proximal end, and to the head of the tibia and fibula at their distal extremity. As the fully extended leg is flexed on the thigh, the hamstring muscles pull on the tuberosity of the ischium and the top of the ilium backward to meet its sacral junction. This procedure of stretching is carried on until the hamstring muscles are thoroughly relaxed, a condition which is indicated by the fact that the fully extended leg can be flexed to a position far beyond a right angle; indeed, the dorsum of the foot almost touches the shoulder. A definite click is often heard during the manipulation, which some have thought to be due to the replacement of the misplaced sacroiliac articulation. Of this, however, Baer is not convinced, for it has seemed to him that the click is to be heard and felt by a slight subluxation of the head of the femur as it pushes against the hamstring while the leg is in extreme flexion. The presence of the click is always synchronous with the relapse of the hamstring muscles and indicates that the work has been accomplished. If one now looks at the back, one finds that the flat back has been replaced by one with a normal lumbar lordosis. Care should be taken in the manipulation, for it is quite conceivable that, with careless handling, one may obtain a subluxation of the knee-joint backward, causing a paralysis, or that one may make a fracture of the head of the femur. The only two complications which have occurred in Baer's series of 100 cases have been, in one case, the setting up of a femoral phlebitis, and in the other, owing to his inability to make a proper diagnosis, the production some weeks later of a tuberculous abscess springing from the sacroiliac joint. After the manipulation has been finished, the patient should be placed on a Goldthwaite frame, and put up in a plaster dressing extending from the nipple line down to the knee on the affected side. This is done to preserve the lumbar lordosis which has been obtained by the procedure.

The patient is allowed to remain in this cast in bed for a period of ten days, when a small pelvic strap, as indicated for the mild forms, is worn as a preventive measure for the next two months.

Baer knows of no class of cases in which the results obtained are so pleasing, both to the patient and his physician.

CHEMOTHERAPY IN TUBERCULOSIS.

Lewis in the *American Journal of the Medical Sciences* for May, 1917, states that the accomplishments of the laboratory up to the present in the endeavor to study tuberculosis from the chemotherapeutic point of view can be summarized in a sentence: there has been built up several substances which in the test-tube are capable of restraining the growth of the tubercle bacillus in marked and measurably specific degree, and which when injected into the living tuberculous animal are capable of penetrating to the center of the masses of diseased tissue.

Attractive as may be the plan by which these substances have been reached, it

would still be only the happiest accident if their further qualities were such as to render them active against the progress of tuberculosis in the animal body. Neither would the failure of two such substances mean that the idea is fruitless. For the present, therefore, their efforts in the chemical laboratory are directed toward increasing the number of substances possessing these (as it seems to them) fundamentally desirable qualities. They have also turned themselves seriously to the testing of the possibilities of these substances and their relation as therapeutic agents. The latter phase of their work is scarcely begun, and Lewis will pass it by with but few words.

Drawing on the literature for precedents he cites the following studies as the most striking of the available examples:

1. Koch and his pupils in repeated experiments during the years 1890-1897 demonstrated that by the use of tuberculin the life of guinea-pigs infected with considerable amounts of pure cultures of the tubercle bacillus could be definitely prolonged. These tuberculin experiments are worthy of the most serious consideration. The same result was reported by a number of different observers at the time, and Lewis finds no contradictory experiments. The exact chemical nature of tuberculin has never been determined, and it is to be presumed that its action comes within the field of immunity reactions rather than that of chemotherapy. Lewis has included this substance in his discussion because he believes that the results with it are the best available standard on the basis of which the value of other results may be estimated.

2. Von Linden in 1912 and again in 1915 presented tables showing that by the use of compounds or mixtures containing copper; or copper and methylene blue; or copper, lecithin, and cod-liver oil as a salve, with or without the separate administration of iodized methylene blue, the life of the tuberculous guinea-pigs could be prolonged. The results as presented compare favorably with those gotten earlier with tuberculin, but in no way surpass them. Attempts to repeat some of the experiments by Corper in this country failed, and Selter abroad has denied their significance.

3. Certain tables published by DeWitt (1914) may be interpreted as evidence that copper and mercury compounds (or salts) of trypan blue can act favorably on the progress of tuberculosis in guinea-pigs, although the author does not put forward any positive claim for them. DeWitt has since stated publicly that she had obtained more definitely favorable results with a mercury compound of methylene blue.

4. Koga (1916) believes he has attained results of value with a compound containing copper and cyanogen. On the face of the evidence again, this substance produces a result comparable to tuberculin, but not surpassing it.

5. In the case of the two substances whose development in their hands Lewis has described above, the one, that made by condensing formic acid with Niagara blue, has done only harm in guinea-pig experiments so far. In this it corresponds to Niagara blue itself. The diazo creosote compound seems in preliminary experiments to be capable of extending the period of life of infected guinea-pigs in certain instances. The percentage of animals favorably affected in any series is less than in the tuberculin experiments of Koch's coworkers.

Those critically inclined need not search far in the original accounts given of any of these experiments to find ground for denying that they are of significance. Such criticism has been offered and will certainly be continually forthcoming. In so far as attempts have been made or are being made to introduce any of these substances into the practice of medicine, any amount of skeptical opposition is in Lewis's opinion fully warranted. In 1890 it was quite justifiable to take the first favorable results obtained in the laboratory and make careful clinical trial of tuberculin. We should, however, profit by this experience and proceed with great caution in the clinic until the evidence shows that new substances are distinctly better than tuberculin experimentally.

In the interest of scientific progress, on the other hand, all of these results should be treated with great charity. In view of the purely statistical nature of the inquiry, the experiments must be repeated a number of times before they are finally accepted as evidence, but it must be remembered that a single failure has no more interest than a single success. If it be granted as a probability that some measures of the truth may lie in these observations, the future of chemotherapeutic studies in tuberculosis is not discouraging. At this stage of development the possibilities compare favorably in this particular case with those which offered for the broader subject of chemotherapy when Ehrlich was first able to cure trypanosomatous mice with trypan red. Several substances seem now to be known which are capable of giving a slight advantage to the host in its contest with the parasite. This number must be multiplied by empirical research through known chemical compounds, and each such substance showing a suggestive lead must be subjected to carefully considered chemical manipulation to develop to the full its latent possibilities. Each year of the five that Lewis has been actively engaged in this work he has seen some added idea or suggestion of real value, and we may be sure that if in the future faith is expressed in continuous experimentation and confidence is put in evidence by financial support adequate to the size of the task in hand the desired results will be achieved.

THE TREATMENT OF GOITRE BY THE ROENTGEN RAYS.

In the *Interstate Medical Journal* for April, 1917, Boggs writing on this topic states that the principal treatment should be directed toward the thyroid, but in many cases the thymus should also be rayed. Do not depend on raying the thymus alone, omitting the thyroid, unless it is where the thymus is greatly enlarged.

The treatment of goitre is major roentgenological work, and should not be attempted by any one unless he is familiar with his technique and knows the physiology and pathology and needs of the ductless glands. A decrease in the pulse-rate and an increase in weight are the first improvements noted. Reduction of the thyroid is not always marked when all the symptoms have disappeared, and the exophthalmos is the last to show improvement. Sufficient results have been produced to give all cases a fair trial; nothing is lost and many operations will be avoided. If the patient is greatly relieved after the first series of treatments, one must not consider the patient cured at this stage.

It is to be expected, if it is necessary to operate, the mortality will be lessened by preliminary roentgen treatment. The aim is to cause sufficient atrophy of the thyroid, so that it will produce a healthy amount of secretion and no more.

THE TREATMENT OF ARTERIOSCLEROSIS.

Stoner in the *American Journal of the Medical Sciences* for May, 1917, says that these patients must not be treated at the expense of their well-being. It requires extreme tact in rightly managing them, for there is a tendency to live around the blood-pressure and become very introspective. Immediately they regard themselves candidates for apoplexy. They very quickly label themselves as high blood-pressure victims and become intensely neurotic. The blood-pressure estimations must always be favorable to their improvement. Here truly can we say that blood-pressure is a very changeable thing; that its determinations can never be made definite; that our means of estimating are only approximate at best; that blood-pressure is a minor thing; that the condition as a whole is our chief concern. It is our duty to take the patient from all strenuousness of life and discipline him in a régime which is favorable to improvement, for after all the problem is one of management rather than a particular drug. We must restrict the diet, particularly in respect to meats, condiments,

stimulants, sugars, and fats. If obese, the cardiovascular mechanism will be relieved by reduction in weight. Many patients are greatly improved in subjective symptoms, such as dyspepsia, cardiac pain, and fatigue, on reduction of weight, which gives a corresponding and often disproportionate reduction in blood-pressure. In severe cases with obesity reduction may best be managed by rest in bed over a period of months.

Overeating, directly or indirectly, is a factor of no small importance in producing cardiovascular disease, be it due to putrefactive substances from the bowel or overtaxing of excretory organs by unused food material. Stoner does not enter into a detailed discussion on a dietary, as certain principles in feeding are to be observed with which we are generally acquainted, and the problem is more or less an individual one. Just how much or how little salt may be given in an individual case is often speculation. However, we knew that withholding salt in cases with edema or pre-edemic states gives encouraging results. Careful dietary, management, and well-regulated exercise will do much in the early cases of hyperpiesia, and no kind of exercise is better than walking. In the more advanced cases a period of rest in bed is essential, with warmth, passive exercise, and baths. A mild and equable climate with moderate elevation is desirable. Excessive hot baths are generally not beneficial and do not give substantial relief, and may give the patient discomfort. The desirable bath seems to be neutral at about 33° or 34° C., and gradually brought to 40°. Nearly all baths affect the cardiac mechanism and should be given cautiously.

The advantages of treatment aside from careful regulation of diet, encouragement of elimination, and gradation of activity are probably overestimated. Authors disagree on value of warm or hot baths, but the tendency is to get away from the hot bath. The quantity of water taken depends upon the individual case; but speaking generally the liquid intake of the hyperpietic case should be restricted to 1½ or 2 liters daily. The radium bath (natural water) has become popular in the management of these cases. It is claimed that it lessens viscosity of blood, increases diuresis, and encourages uric-acid elimination, and hence lowers blood-pressure. Electric-light baths have been advised, but should be used in the same careful way as tub baths, starting at lower temperature and gradually increasing to 90° or 100° F. Electricity in the way of high-frequency currents is advised by some and discouraged by others. Stoner believes the consensus of opinion is that it lowers peripheral resistance and, of course, lowers pressure.

Venesection is of value in the high-tensioned case, is of value in warding off a crisis, and may be repeated at intervals in certain selected cases. It is a very simple procedure by placing a towel as a tourniquet above the elbow, tapping the space at the bend of the elbow to bring out the vein, scrubbing with alcohol, and inserting a needle of sufficient lumen to permit a free flow, which is encouraged by having the patient alternately close and open his hand. Bleeding is contraindicated in cases of high pressure, with kidney involvement, when there is a degree of anemia. The blood-pressure is lowered for only a short period, but a sense of relief is experienced from the pressure symptoms. It is contraindicated in the decrescent form with low blood-pressure.

In treating blood-pressure we must appreciate that the process is largely compensatory, and our interference should be cautious. Therefore, in so far as vasodilator drugs fail to relieve a cause as a toxin we must consider how much lowering of pressure in this way brings about good. However, if our experience teaches us that symptoms can be relieved and the patient be given no hazards, symptomatic treatment is justifiable, and so long as we are unable to prove that their high pressures may be due in part at least to toxin irritating the vasomotor center, it seems quite rational to give vasodilators, such as nitrites, even over an extended period of time, if pressures are lowered and the patient is made more comfortable without untoward signs, such as

edema or a failing myocardium. Nitroglycerin in drop doses has a definite place in relieving cardiac or anginoid pains, and Stoner not infrequently places it in a patient's hands to be used cautiously when indicated. Just how so-called vasodilators act is speculation. It is accepted that diastolic pressure is lowered, and the question is whether by peripheral dilatation or splanchnic dilatation or by lowering cardiac energy. We should watch not only our systolic but diastolic pressure when administering such drugs. At best, drug therapy is only an adjunct to the treatment of these cases. Mercury is employed, but in the non-syphilitic case Stoner has had no experience. Iodides unquestionably have value if given intensively over a period of time with alkalies, even though animal experimentation is to the contrary, but we cannot compare normal with abnormal arteries. Just how is speculation, whether by lessening viscosity of the blood, by lessening spasm, or by excitement of the thyroid.

NOVARSENOBENZOL AS A SUBSTITUTE FOR NEOSALVARSAN.

TAYLOR in the *China Medical Journal* for March, 1917, states that during the two months, June and July, 1916, when the drug could be procured by him, he gave fifty-six intravenous injections of the new French preparation novarsenobenzol. From a clinical standpoint these cases have been highly satisfactory. As yet his laboratory is not equipped for performing Wassermann reactions, but he hopes soon to be able to make this test in order to study more thoroughly the real efficiency of this new substitute for neosalvarsan.

His method of intravenous injection is as follows: Into a clean, sterile, white bottle, with rather large mouth, 100 Cc. freshly distilled water is poured. (The bottle has two marks scratched on it with a file, one at 100 Cc., and one half-way between, at 50 Cc.) After the vein is dissected out and ligated distally (this is unnecessary—ED.) the novarsenobenzol is poured into 100 Cc. of the distilled water in the bottle. The yellow powder goes into solution immediately, and the mixture can be injected at once, being perfectly neutral in reaction. First, a little normal salt solution, made from chemically pure sodium chloride, is allowed to run into the vein from the long glass tube. Before this has entirely run out the novarsenobenzol solution is poured in, and this in turn is finally followed by more salt solution poured into the same tube by an assistant. By this simple procedure only one glass tube is necessary, and the drug to be injected into the vein is both preceded and followed by non-irritating salt solution.

In all his fifty-six cases he injected two patients at a time, using 50 Cc. of the solution for each patient. In this way their first dose was 0.30 gramme. The two cases were always prepared at the same time by two separate operators, and with separate sets of instruments.

The temperature of the distilled water in which the drug is dissolved must be cold (68° F. to 71° F.). The mixture cannot be set aside after it is made as it oxidizes very rapidly, forming poisonous by-products. It must be given at once. (In one of his packages one bottle had been broken. The contents had almost entirely disappeared, leaving a small black residue.)

In this series of cases, giving 0.30 gramme as a dose, there were only two unpleasant reactions. One patient vomited while the solution was running into his vein, most probably a psychic effect, and in the other the temperature was 104° F. four hours after injection. As the latter patient had sacroiliac tuberculosis, with a sinus, it is possible that the fever was due to his tuberculosis and not to the drug injected. In all the other cases there were no symptoms due to the injection other than at times slightly chilly sensations following the operation.

Every case showed improvement after the first dose, and some were startling in the rapidity with which they cleared up. The most rapid results were in cases of well-marked secondary rashes. Some of

these very violent rashes seemed to fade away over night, and be entirely gone from the third to fifth day. The cases with joint pains also improved quickly after the first injection.

There were three cases with extensive tertiary lesions; one of the scalp, and two of the legs, which had resisted mercury and potassium iodide for nearly a year. These improved rapidly in a few weeks after each had received two injections of novarsenobenzol.

There were also two cases of spastic paraplegia, which rapidly improved after two injections. One patient who had been brought in on a stretcher was able to walk out of the hospital after two weeks. The other could sit up when he left the hospital, although when he came in his condition was one of extreme spastic paraplegia. He was instructed to continue taking potassium iodide and mercury inunctions, and to return in three weeks for a third injection, and later for a fourth. It will probably be necessary to lengthen the flexor tendons of the legs in this case before they get straight again.

As yet Taylor does not know how much of this drug it takes to effect a cure, but in his clinical experience he does know that even one dose is always followed by some improvement, and that in 0.30-gramme doses there are no unpleasant after-effects such as violent chill, vomiting, abdominal pains, or high temperatures.

CONSERVATION OF THE HEART IN THE AGED.

In the *Medical Review of Reviews* for May, 1917, BROOKS points out that as a rule the aged person, unless still required to exert a considerable amount of physical energy, desires less of the highly nitrogenous foods, and in but very exceptional cases has he found it necessary to give the meats in the amounts commonly found advisable in earlier life. This applies especially to beef, mutton, and also eggs. Vegetables, and particularly the more bulky ones, as celery, string-beans, cauliflower, cabbage, salads, and fruits are commonly much more acceptable and certainly more desirable in these cases. The fruit juices, soups, and especially the vegetable and fish, are desirable and acceptable except in those cases in which there is a tendency toward ascites or edema.

Brooks believes that salt in most cases should be cut down to the amount actually demanded because of its very direct bearing on the retention of fluid in the tissues, which is in itself one of the most serious tendencies in the defective circulation of senility. The irritant condiments, pepper, and particularly the very hot sauces and spices, should be largely eliminated because of their irritant action in the excretory glands, and their subsequent effect on the work of the heart.

The fruits are a matter of considerable question, Brooks finds among those who should be best qualified to judge as to these dietetic matters. His own preference is to allow them freely unless there be some specific reasons for their limitation, such as for example often exist in low sugar tolerance, and again in the tendency to retain a superabundance of fluid in the body.

Sugar in some form of sweets or as sweetening is commonly much craved by old persons, and Brooks is one of those who feel that as a cardiac food, if we may be permitted to use so indefinite a term, sugar is most useful. He employs it in the usual sweetened foods, the fruits and fruit juices, as lactose, orangeade, or cereals and so forth, unless there be direct contraindication. Sugar seems to be very easily metabolized by the senile tissues, unless indeed there be a lowered tolerance for it, and it quickly gives up its energy, furnishing thus a material particularly adaptable to the needs of the defective heart.

Brooks feels very much in the same manner in regard to the use of the alcohol drinks in the same condition, unless some definite contraindication, as a renal or hepatic disease, exists, and he fully agrees with Osler in his apt statement that alcohol may be often considered as the milk of the aged.

Now as to the use of a highly milk diet in the senile heart: It has not been Brooks's experience that this is a very desirable food, certainly not in many instances at least, nor even in general. Its lime, sodium chloride, and water contents are not of particular utility in senility, and they are often of direct harmful nature. The caloric value of milk considered in relation to its bulk is not high, and its more essential properties for the aged may be given in the form of cheese, which Brooks finds is a most acceptable and satisfactory substitute for meat in every instance, where of course the digestive conditions permit its use. The cereals, or most of them, are very satisfactory foods in the ordinary instance.

The question of the use of tobacco is another point of considerable moment in a great many cases, because of the comfort which the weed gives, and the real solace of the habit in the lonely hours of old age. Brooks much regrets to say that from the cardiac standpoint he does not consider its use advisable, though one sees many cases in which it seems to be employed, even excessively, without bodily harm and often with great mental comfort.

The same must be confessed about tea and coffee; but as a stimulant, if indeed it be such, for Brooks himself prefers to consider it a quickly carbonized food, alcohol appears to him far superior than either of the others mentioned.

Although, as already pointed out, excessive strain—that is, overexercise—is to be strictly forbidden, it should be practiced to some extent, and where for circulatory reasons exercise in its customary forms is not permissible, massage or active and passive movements may be substituted.

We must not forget that emotional strain is quite as harmful, if not even more so, for the senile heart as physical stress. In defective or purely senile cases the emotions must be conserved particularly. If business worries or social responsibilities harass, they must be eliminated as far as possible. It is, however, one of the most difficult questions Brooks finds to solve for the elderly person to advise his giving up his customary responsibilities and work. In many cases Brooks has found a retirement from business to be followed by rapid circulatory and mental decadence, and he really believes that in most cases in which the mentality is retained in an aggressive form patients are better to continue at least the form of more or less their customary responsibilities, unless indeed they be one of that fortunate class provided with an engaging hobby which becomes a pleasing substitute for work.

The long anticipated pleasure of travel for many senile persons is another question which we are frequently called upon to solve. May the man with a senile heart safely and profitably travel? This depends very largely of course on the comforts with which he may be able to provide himself in his wanderings, and to a very large extent on the places to which he wishes to go.

CARDIOVASCULAR LUES.

GREENE in the *Journal-Lancet* of May 1, 1917, concludes an article on this topic with these views which bear on treatment:

1. The discovery of treponema pallidum, perfected methods of demonstrating it in body tissues, the development of the Wassermann and luetin tests, and careful and extended studies based upon these, have resulted in an exact knowledge of the wide dissemination of syphilis and its enormous importance as a factor in the causation of diseases of extraordinary diversity.

2. We now know that the term "cerebrospinal syphilis" embraces a large number of diseases in which its presence was formerly only assumed or wholly unsuspected.

3. It now appears that, to an extraordinary degree, the mortality of the disease depends upon its vascular ravages, which are proven fundamental in many ailments of strikingly diverse complexion.

4. It may assume any one of the various forms of sclerosis, endarteritis, or myocardial degeneration, but presents in most instances in the earlier stages of the latter, certain characteristic lines of attack and modes of histologic expression.

5. The most characteristic of these is the productive mesaortitis of Francis H. Welch, extraordinarily prevalent, almost constant microscopically in a more or less developed form at autopsy in every case of proven syphilis, and the actual cause of death in 50 per cent or more of such cases.

6. This disease shows a peculiar affinity for the first portion and arch of the aorta, and tends to assume at the root of that artery a characteristic line of march which in 80 per cent of the cases results in the establishment of secondary aortic regurgitation of a peculiarly progressive and intractable type, once it reaches the stage of frank myocardial insufficiency.

7. In 20 per cent of such cases of the advanced type true aneurism and frank angina pectoris major occur in about equal proportions.

8. The leading symptoms, aside from those of aneurism and actual angina pectoris, are pain, dyspnea, diffuse dilatation of the aorta, and progressive crippling impairment of the vascular reserve.

9. Many of these cases are wholly silent, and the symptom-complex may be blended, incomplete, or so misleading as to be most readily misinterpreted.

10. Only through recourse to more rational methods of early diagnosis, dependent upon the proper recognition and weighing of minor symptoms, subjective and objective, may these cases be detected early enough to render specific treatment properly effective.

11. The utmost importance attaches to the Wassermann test, but only when it is in the hands of an expert serologist.

12. The improper use of this test and the false reliance placed upon it must vitiate many reports, and result in errors of omission and commission, damaging to the physician and a source of humiliation and injustice to the patient.

13. Finally, a consideration of this topic emphasizes not only the importance of the individual cardiovascular luetic lesions, but also the terrible potency of syphilis as a cause of death at a period remote from the primary infection and through channels which so conceal its identity as to obscure the fact that it may yet come to be called the "Captain of the Men of Death."

HEAD COLDS FROM THE STANDPOINT OF THE INTERNIST.

In the *American Journal of the Medical Sciences* for May, 1917, REILLY expresses the belief that two-thirds of the profession prescribe quinine in the early stages of these complaints, and some continue its use throughout. Certainly, there is no agent which so quickly congests the mucous membranes of the tract as quinine, and sometimes even in small doses. One can understand the homeopath prescribing small doses of quinine on the Hahnemannian principle that slight congestion will relieve intense congestion, but from any other view-point it is difficult to see the rationale of its action. There are millions who swear by it, as he supposes there were millions who vouched for the value of bloodletting, antimony, etc. Personally, Reilly has never seen any good from its use, although he has used it often and in various doses; and he has often seen harm follow its employment.

Dover's powder is still used at the onset, oftentimes with the idea of aborting the cold. Unfortunately, medicines can rarely strangle germs. It is not as popular as it used to be, possibly because more people now seem to be susceptible to the disagreeable after-effects of opium than formerly, or because of the anti-opium hysteria which has spread over the country. Reilly has never satisfied himself that its benefits equaled its disadvantages.

Acetyl salicylic acid, he believes, does relieve symptoms, and in small doses it does not congest the mucous membranes seriously. In some patients relief is undoubtedly afforded by atropine. Under the title of rhinitis tablets this medication is much in vogue. The well-known combination of quinine sulphate (½ grain), fluid extract of belladonna (⅛ grain), and camphor (¼ grain) makes the practitioner feel that he is orthodox in using quinine and camphor

in treating a cold, but it is the atropine that produces the results. The dryness of the mucous membrane that follows its use causes most people, after a time, to discontinue it. In order to obtain good results it must be given early in the attack, *i.e.*, within the first twelve hours, and repeated every half-hour or so until the physiological effect is produced. Of course it does not cure the cold, but it alleviates the most prominent symptoms of coryza during the first day or two. After that the disease runs as before. It is useless in the moderate and descending types of the disease. When the profuse watery discharge is very troublesome a powder consisting of bismuth subnitrate (℥ij), starch (℥j), gum arabic (℥ss), with menthol (gr. ij) or antipyrin (gr. x), may be snuffed up. This almost always gives considerable relief.

Much has been said of the use of vaccines in this complaint, but it is difficult to judge of their effect because the vast majority of the cases are in the very nature of things better before a second injection may be made. If one takes the standard laid down by Wright and his followers, who state that there is no marked improvement in the opsonic index in the vaccinated before a period of from four to seven days after the first injection, then by the time the second injection is due nature has cleared up most of these cases, so that it is difficult to decide what effect has been produced. Whether their continued use at the approach of the fall and winter season will prevent subsequent attacks is also a matter that must always be open to question, as nature sometimes herself protects. Personally, Reilly's results with vaccines, either as a curative or a prophylactic measure, have not been successful.

Practically all those who consult a physician for this complaint do not do so until after the second day of its invasion. At this time, again, the hygienic advice mentioned above should always be given. If there be much general soreness or pain, acetphenetidin may be added to the acetyl acid salicylic, but the atropine is useless. However, in these cases the local treatment is by far the most important. It has been Reilly's habit to begin with an alkaline spray under fifteen to twenty pounds air-pressure. This is always followed by a free exudation of mucus. This is repeated until a mild blowing of the nose is not followed by muco-pus.

In very sensitive nostrils a spray of 0.5 per cent cocaine may be employed previously, but Reilly has rarely found it necessary. If there be much headache or face pain an adrenalin spray of 1:10,000 is employed; usually this is not necessary. Ordinarily after the alkaline spray the following spray is used: Acid carbolic, mins. iij; iodine, potas. iodid., ää gr. vj; aqua menth., glycerin., ää fl. oz. ss; aqua q. s. ad fl. oz. iij. This is sprayed until it reaches the throat.

After this an oil spray is employed for about two minutes. The composition of this oil spray is as follows: Ol. cloves, mins. x; camphomenthol, gr. xxiv; ol. pinus sylvestris, mins. xx; liq. petrolatum, q. s. ad fl. oz. iij.

All of this treatment does not consume more than five minutes when an electric power pump is used.

By these measures one does not intend to destroy all the germs but rather to lessen their virulence and provide drainage, sound surgical measures in any infection. When the infection has traveled to the bronchi these cases are usually treated by various expectorants and narcotics.

THE METABOLISM AND TREATMENT OF RHEUMATOID ARTHRITIS.

In the *American Journal of the Medical Sciences* for May, 1917, PEMBERTON in an article on this subject reaches these conclusions:

1. Experiments are cited in which it has been possible to relieve patients of all or practically all symptoms of diffuse arthritis by a large curtailment of carbohydrate coincidentally with the ingestion of fat in such increased amounts as to make up or exceed this caloric deficit. When the protein intake has been kept approximately

constant some such patients have actually gained weight while convalescing. This evidence by exclusion ascribes an injurious rôle to carbohydrate, is additional to that already published, and is corroboratory of it.

2. It is difficult to avoid the conclusion that fat, while it cannot be used with impunity in treating these cases, plays a relatively harmless rôle in marked contrast to carbohydrate. It can apparently be used in many cases to meet, more or less, the loss of weight which would otherwise ensue, and in certain selected cases to meet it entirely or even to cause the patient to gain weight.

3. The difference in the effects of large amounts of carbohydrate when ingested by normal individuals and by subjects of rheumatoid arthritis is not reflected in the carbon dioxide tension of the alveolar air under the limited conditions of the experiments.

FOREIGN BODIES IN THE EYE.

GREEN in the *Interstate Medical Journal* for April, 1917, says that in order to determine the presence of the foreign body he uses focal illumination and a magnifying glass (watchmaker's loupe is good, as it leaves both hands free; a binocular loupe is still better). Very minute bodies may easily escape detection unless the light is projected from different directions, or the patient is made to rotate his eye. Having determined the location of the foreign body, he notes whether it is surrounded by a delicate gray or yellowish ring (beginning infection). After 3-per-cent cocaine hydrochloride, or 1-per-cent holocain hydrochloride (instilled three times at two-minute intervals), he stands behind the patient, and has him rest his head upon his chest or upon the back of the chair; he then separates the lids with the fore and middle fingers of the left hand, instructing the patient to keep both eyes open (the tendency is either to close both or roll them upward) and to look at an object which he designates. It may be necessary, in order to bring the foreign body perfectly into view, to have him shift his gaze a little to the right or left, or up or down. It is much easier for the patient to obey an instruction, "Look at the window-fastener," or "Look at the sash," than to look "a little" to the right or left. Definite fixation of an object also insures a much steadier globe for the operator's manipulations. The foreign body spud (Green's preference is for Wheeler's corneal curette) is insinuated beneath the foreign body, which, by the gentlest manipulation, strictly confined to the site of lodgment, is lifted out.

A careful search should then be made to see whether there is any unremoved particle; often, in the case of cinders or emery particles, the bed of the foreign body contains a brown ring of charred tissue. It is very essential that this also should be curetted out. To define exactly the area denuded, a single drop of a 2-per-cent solution of fluorescin (potassic fluorescide) is instilled, and the patient instructed to close his eyes for a few minutes. The excess solution is flushed out with 2-per-cent boric solution. It will be found that the corneal area denuded of epithelium is stained brilliantly green, the rest of the cornea and conjunctiva showing no discoloration. A toothpick, or match sharpened to a fine point, is dipped in tincture of iodine, the excess gotten rid of by gently shaking the pick as one would shake a clinical thermometer, and the iodine-soaked end brought into contact with the denuded area. In a case suspected of beginning infection pure carbolic acid should be applied in the same manner. As an applicator a toothpick is much superior to a metal probe, for the reason that the wood fiber absorbs the solution and the minutest quantity (a small fraction of a drop) can be applied with precision directly to the area; there is no tendency to spread beyond the point intended. The eye is then flushed out with 2-per-cent boric solution. A small quantity of White's ointment (bichloride vaselin, 1:3000) is inserted in the conjunctival sac and the eye sealed with an "occlusive dressing." By an "occlusive dressing" Green

means one that will effectively debar the inquisitive fingers of the patient from gaining access to his eye. The dressing that he uses is made as follows: A round of cotton, 2 inches in diameter, is dipped in bichloride (1:3000) and wrung dry; this is placed over the closed lids and patted down to conform to the contour of the lids; a small ball of dry cotton is placed over this, and the whole held in place by a round of gauze, which is pasted to the forehead, temple, cheek and nose by flexible collodion.

Every one's tendency is to finger a body wrapping and especially an eye bandage. Recipients of foreign bodies in the eye often return to their foundries or factories to report, and there the surroundings are anything but clean. The amount of grime that an eye dressing may acquire superficially in twenty-four hours is often surprising, but it is certainly comforting to feel assured that, so long as the ring of collodion holds intact, there is no chance for extraneous dirt or infection to find its way into the eye. If the fluorescin staining reaction is present at the first dressing the occlusive dressing is reapplied for another twenty-four hours.

To recapitulate, the steps to be followed are: (1) cocainization; (2) clean removal of the foreign body; (3) topical application of tincture of iodine or pure carbolic acid; (4) insertion of bichloride ointment into the conjunctival sac; (5) occlusive dressing. This routine will effectively guard against extraneous infection and recurrent corneal erosion, which sometimes follow the open method of treatment—*i.e.*, without bandage.

One possible source of infection should be borne in mind—*e.g.*, a chronically infected lacrimal sac. Some of these sacs are painless, and give their possessors little concern save for the overflow of tears. An eye adjoining such a sac is always in peril; a corneal abrasion usually becomes infected, and then we have the picture of the so-called "serpent ulcer," which may lead to perforation and complete destruction of the eye. In the presence of this complicating factor, ophthalmic consultation should be promptly secured. In the meantime the eye should be left open, and, as a prophylactic measure, should receive every hour 10 drops of a 1-per-cent or 2-per-cent solution of ethylhydrocuprein hydrochloride (now unhappily unobtainable on account of the war) which has a specific action on the pneumococcus, the organism usually responsible for chronic inflammation of the sac.

TOXIC SYMPTOMS AFTER THE USE OF BISMUTH PASTE.

In the *Lancet* of April 14, 1917, HEPWORTH makes an interesting report on this important subject. In view of the increased use of bismuth paste and its great value in the treatment of infected wounds, he publishes the results of an investigation into a number of cases suspected of poisoning which have occurred in the surgical wards of the Wharncliffe War Hospital, Sheffield.

Five men have been found to show symptoms suggesting plumbism, and although under the care of different surgeons and in different wards they are alike in suffering from severe septic wounds, and in the fact that all were treated by the application of bismuth and iodoform paste (B. I. B. P.) according to Professor Rutherford Morison's technique. This paste has been in use here from September, 1916, and is still being used. The method was very kindly demonstrated to Hepworth by Professor Morison in November, and has been proved to be very beneficial.

Up to November 3, the paste was prepared from bismuth carbonate, which was afterwards tested, and no lead contamination discovered. After November 3, a new lot of bismuth subnitrate was used, as in Professor Morison's formula; this stock lasted for about four weeks, and it was among the cases treated during this period that those suspected of poisoning occurred. Unfortunately, the subnitrate was used up before the symptoms had been noticed, and the drug was therefore not analyzed. Since

the beginning of December, both bismuth carbonate and subnitrate have been used, and both have been examined and declared lead-free by Staff-Sergeant F. C. Thompson, R.A.M.C. The method of testing is added to this report as a separate note. The drug was obtained from the base medical stores at York.

In this report seven cases are included, all of which were treated by the Morison method; they represent all the most severely wounded and most septic cases treated with the bismuth paste at that time. Many slighter cases were similarly treated, but none showed poisoning. Of the seven cases, five had symptoms of poisoning, and two were free.

In the accompanying table, which gives details of the cases, it will be seen that four patients developed a blue line of the gums. This was first noticed in Private Y., who complained of a sore mouth ten to fourteen days after his operation, and was found to have a broad band of bluish pigmentation inside the cheeks, and on the sides of the tongue, as well as an unusually thick line on the gums. Other patients were then examined, and three more were found with less noticeable but still distinct "blue lines" —Sergeant R., Private B., and Private D.

Anemia was present in all seven cases, and disappeared as the wounds healed. Constipation was especially noticeable in Private Y. Both symptoms are so common among men with severe wounds that they are of little diagnostic value. No neuritis, wrist-drop, colic, or headache has been noticed. Mental stupor was a troublesome feature in one patient (Private D.), but had been developed before his treatment with bismuth paste.

Loss of sphincter control, delirium, and sleeplessness continued for two or three weeks in the case of Private J. B., who was extremely ill and thought to be dying. His infection was severe and his knee-joint was involved. Improvement followed, not directly after amputation, but as the suppurating amputation wound cleaned up. His symptoms, therefore, may have been due to plumbism, but are much more likely to have been caused by septic intoxication or iodoform poisoning.

Blood changes were looked for by our pathologist, Major A. E. Naish, R.A.M.C. (T.), but no granules were found in the

DETAILS OF CASES, INCLUDING THOSE WITH TOXIC SYMPTOMS AFTER USE OF BISMUTH PASTE.

—	Disease.	Date of wound.	Severity and character of wounds.	Date of operation and application of B. I. P. P.	Date of symptoms.	Severity and character of symptoms.
Pte. Y.	G. S. W. both legs. Double amputation in France.	July 7, 1916.	Large granulating flap wounds at level of knees.	Double re-amputation, Dec. 5, 1916.	Dec. 16 onwards.	On Dec. 16, 1916, complained of sore mouth; had broad blue line on gums and cheeks Dec. 20. Constipation; no colic; anemia. Wounds healed by Dec. 30.
Pte. D.	G. S.W. left thigh. G. S.W. left foot. Comp. fracts. of femur and tarsal bones.	Aug. 6. 1916.	Both wounds severe. Much suppuration. Fractured femur in bad position.	Nov. 17, 1916.	Dec. 20.	Blue line on gums, Dec. 20. Mental stupor on Dec. 1, but had been difficult to manage and stuporous to less extent during early part of November. Anemic all the time. Wounds healed by Jan. 7, 1917.
Pte. M.	G. S.W. left shoulder. Fract. of greater tuberosity of humerus. Joint involved.	Oct. 25, 1916.	Wound pouring with pus. Temperature 103° every evening.	Nov. 12, 1916.	—	No toxic symptoms. Steady improvement.
Pte. B.	G. S. W. right thigh. Comp. fract. femur. G. S.W. left wrist.	Nov. 10, 1916.	Septic wounds. Femur comminuted.	Nov. 27, 1916.	About Dec. 20.	Well-marked blue line on gums. Anemic (but was so before operation).
Sgt. R.	G. S.W. right shoulder Fract. of greater tuberosity of humerus. Joint infected.	Nov. 13, 1916.	Deep wound tracking behind joint, and under scapula. Septic.	Nov. 27, 1916.	About Dec. 20.	Pyorrhea alveolaris, with thin blue line on gums. Transient anemia.
Pte. J. B.	(*a*) G. S. W. left buttock. (*b*) G. S. W. left thigh. Comp. fract. femur. Knee-joint infected.	Nov. 16, 1916.	Infected, but well treated by Carrel method. Bone projecting into suprapatellar pouch of knee.	(1) Nov. 27; (2) Dec. 14.	Dec. 4 and later.	No blue line on gums. Delirium; sleeplessness; high temperature; loss of control over sphincters. All these symptoms were considered to be due to septic infection.
Pte. H.	G. S. W. right thigh. Comp. fract. of femur.	Sept. 15, 1916.	Track through thigh from side to side. Septic. Bone comminuted.	Oct. 27, 1916.	Nil.	No toxic symptoms. Progress in this case was much better after the use of the bismuth paste. He had shown practically no improvement previously.

corpuscles. The urine was also examined for lead, but no trace found in any case.

Opinion was, at first, strongly in favor of the view that the symptoms in these patients were due to lead absorption, especially as the cases occurred while one particular batch of bismuth preparation was in use. But in Sir Thomas Oliver's book on "Lead Poisoning," p. 135, it is stated that "A blue line on the gums, with difficulty distinguished from that caused by lead, may be observed in persons to whom large doses of bismuth have been administered by the mouth; or who, as the subjects of empyema, have had injected into the fistulous tract in their thoracic wall bismuth emulsion."

And in these cases, with the exception of the "blue line," no typical symptoms of plumbism had been present, although with so intense a blue line as occurred in the patient, Private Y., other symptoms might reasonably be expected to occur. In view of the importance of a correct diagnosis it is very unfortunate that none of the bismuth preparation used in treating these particular cases was obtained for chemical examination.

Method used for detecting a trace of lead in bismuth carbonate or subnitrate by Staff-Sergeant F. C. Thompson, D.Sc., R.A.M.C.: The usual tests for lead are useless. When dissolved in nitric acid, lead can be precipitated as PbO_2 on the anode of an electrolytic cell, while bismuth goes to the cathode. The following method, which is simple, very delicate, and requires no special apparatus or skill, has been worked out for the purpose:

Dissolve 5 grammes of bismuth compound in 10 Cc. of concentrated hydrochloric acid. Dilute until bismuth oxychloride is just precipitated and redissolve in a few drops of HCl. Filter if necessary through a dry funnel into a dry beaker. Add 3 Cc. concentrated sulphuric acid, cool, and add an equal bulk of alcohol, and put aside. 0.07 per cent Pb gives a milkiness in about five minutes; 0.02 to 0.03 per cent Pb gives a faint milkiness in about four hours.

INTRASPINAL MEDICATION IN THE TREATMENT OF SYPHILITIC DISEASE OF THE NERVOUS SYSTEM.

GAINES tells us in the *Medical Record* of June 16, 1917, that his experience in intraspinal therapy extends over a period of three years. His preference has been for the Swift and Ellis method, and the results obtained in approximately 100 injections as compared with other methods in a total of 70 cases of neurological syphilis have led him to conclude that in intraspinal therapy carefully and properly administered we have a safe and valuable means of combating cases of neurological syphilis—cases which frequently respond to no other method.

The type of case which is benefited is first of all the early case of no matter what type. As a rule, those showing meningitic involvement, as evidenced by high cell count and globulin content, have a better prognosis. The majority of the responses to Gaines's inquiries consider paresis the least amenable to treatment, with the notable exception of Cotton, who has had a very large experience with this disease, and whose optimistic opinion concerning it is entitled to corresponding consideration.

All agree that intraspinal therapy is practically free from danger, when due care is exercised in the preparation of the serum, in the technique of the administration, and in the after-care of the patient. Fully 10,000 intraspinal injections have been given by those quoted in this paper, and only two or three unfavorable reactions have occurred.

There are now in vogue three principal methods of intraspinal therapy: the Swift-Ellis method, the Ogilvie method, and the use of mercurialized serum. Each method has its advocates, but the general trend of opinion seems to be in favor of the Ogilvie method. Good results are being obtained by all methods. The method of intraventricular therapy using serum prepared by Ogilvie's technique is reported only by Cotton and used by him in paresis. This

method should merit much interest and promises unusually good results.

The question of when to use intraspinal therapy is of importance. Many of those quoted in this paper use it in cases of neurological syphilis when other methods fail. Others, including the writer, feel that valuable time may be saved in using the method from the beginning, especially in tabes and paresis, while in cerebrospinal syphilis, intravenous salvarsan, mercury, and potassium iodide may first be tried.

What influence has intraspinal therapy on serology? Provided the method is used early and energetically and frequently, the four reactions may be rendered permanently negative. In many cases, however, the Wassermann remains positive, though the cell count and globulin content are reduced to normal. Even in the presence of a positive Wassermann there is frequently clinical improvement or apparent cure, while in the serologically negative cases there is corresponding clinical improvement.

It has not been recognized until lately the importance of long and frequent treatment in syphilis generally, but especially in neurological syphilis. Noguchi has shown that salvarsan is far more effective if given in a series of rapidly repeated injections than if given at long intervals, in which case there is developed an actual resistance to the drug. Those with the most extended experience now advocate intraspinal injections, every one to two weeks, or the intravenous injections once or twice a week, until the four reactions become negative. One should not conclude that a case is Wassermann-fast until after a prolonged trial of from 10 to 20 injections.

Finally it must be emphasized that the early cases are the hopeful ones. Dead tissues cannot be revived, but cases in which the disturbance is due to inflammatory reactions in the central nervous system, especially where the meninges are bearing the brunt of the infection, are those in which brilliant results may be expected.

THE CONTINUOUS BATH IN MENTAL DISEASE.

In the *Journal of the American Medical Association* of June 16, 1917, STRECKER writes interestingly on this topic. He says that perhaps the fact that the continuous baths were first employed in mental disease and have found their most general application in this field has led to their neglect in the treatment of certain other conditions, which, although not generally classed as insanity, nevertheless present similar problems. Patients with delirium tremens, for instance, are generally referred to the general hospital, where the method in vogue is usually mechanical restraint plus hypnotic and stimulating drug therapy. Alcoholic delirium is essentially a toxic psychosis in which the psychomotor excitement, although more intense, does not differ materially in its characteristics from that of the deliriums of certain fevers, of high-grade infective-exhaustive states, and of so-called "delirious" mania. There is, in all, the same imperative need of rapid and free elimination to reduce the toxicity, and sleep to prevent exhaustion. Hypnotic drugs not only are frequently ineffective, but if they are to succeed at all, must be given in large and dangerous doses. At the Boston Psychopathic Hospital, ten unselected patients with delirium tremens were treated in the continuous tubs with the addition of moist packs and eliminatory measures, without a single fatality. Fifty cases selected at random in series of ten from five general hospitals, in which the method used consisted of mechanical restraint, hypnotic and stimulating drugs, showed a mortality of 26 per cent. In this connection it may be remarked that in several instances Strecker has found the prolonged bath a valuable adjunct to the Lambert-Towne treatment of narcomania in helping to combat the marked restlessness, which commonly makes its appearance on the second day.

On the family physician, who generally first sees the acute mental case, devolves the exceedingly difficult problem of caring

for the patient during the longer or shorter interval which precedes admission to the hospital. Certain of the objective manifestations of acute insanity, insomnia, motor restlessness, and vocal activity appeal to the laity in the light of fundamental disorders of the mind, and there is a naive but insistent clamor for an immediate exhibition of the magic hypodermic which will soothe the troubled spirit and produce sleep. The physician cannot well avoid the moderate employment of hypnotic drugs, but he can limit their use by resorting to other measures. A prolonged and even a continuous bath can be safely given in an ordinary bath-tub, provided an efficient nurse is in attendance. Mental disease in itself is serious enough without the addition of a complicating drug toxemia.

A few cases of "postoperative mania" suggest that continuous bath treatment is frequently a practical method of caring for the surgical patient who develops acute mental symptoms. If there is actual danger of mechanical violence to the wound, the principle of non-restraint may have to be sacrificed as the lesser of two evils. The active, untidy surgical and mental patient is under infinitely better conditions in the bath, in which comparative asepsis can be maintained without great difficulty, than when confined to a room in which even the most diligent care cannot prevent a septic environment. The bath has been repeatedly recommended for the decubitus which is often a serious feature of the late stages of paresis. Strecker has seen an obstinate ulcer of the foot on which the usual medication, and even repeated scarification, made no impression yield readily to a continuous bath of physiologic sodium chloride solution.

Perhaps the principal disadvantage of the baths is their cost, both as to installation and operation. Furthermore, the intensive nursing required is a matter of considerable expense. Careful and intelligent care, before, during, and after the bath, is the only certain method of avoiding accident and of realizing the fullest possible value of the treatment. Probably if the amount saved under the conditions of the bath, in caring for the untidy and destructive patient, could be computed, the importance of these factors would be materially lessened.

It seems conservative to assert that the continuous bath is the most satisfactory method we have of treating the fairly large group of excited states which are encountered in many of the psychoses.

THERAPEUTIC USES OF RADIUM.

HAZEN in the *Virginia Medical Semi-Monthly* of June 8, 1917, expresses the belief that radium may be expected to influence favorably a low vitality of body tissue exposed to it, this devitalized condition being congenital, or acquired by infection, injury, or senility. It may be expected also to favor the destruction of new growths by overstimulation or by selective action. We are justified in believing there is such a thing as "selective" action, whereby normal cells have their resistance increased and pathological cells are at the same time favorably affected.

The skin and mucous surfaces are those structures which are most likely to be within reach of this therapy; the areas thus treated will necessarily be small on account of the rarity and costliness of the agent. For this reason, other methods, as the *x*-ray, will often be more available. The destruction of small skin growths is well within the practicable range of this therapy; and the shrinking of circumscribed tumors, like fibroids of the uterus, can be undertaken with fairly large quantities of radium.

The London Radium Institute reports that warts and papillomata yield readily to short exposures; cavernous nevi do well; keloids give excellent results; the treatment is of use in lupus vulgaris, and lupus erythematosus often responds favorably; leucoplakia patches are speedily removed, but tend to recur; carcinoma of breast, uterus, rectum, show a favorable influence,

but "cure" should not be spoken of in this connection; in fibroid conditions of the uterus there is a most beneficial action upon the distressing symptoms, menorrhagia and metrorrhagia.

The reports from the New York Skin and Cancer Hospital would indicate the same general findings. Dr. W. S. Russell, of that institution, quotes the workers in the Paris Biological Laboratory and the London Cancer Hospital to the effect that operation is safest in early cancer, and radium is a useful adjunct following operation.

THE TREATMENT OF GOITRE.

In *Northwest Medicine* for June, 1917, MOORE states that in presenting his paper he lays no claim to originality, but wishes to relate his experience with a method that has proven very satisfactory, and to present this treatment in concise form, its advantages and disadvantages, stating in a practical way the classifications of thyroid diseases that respond to it and suggesting a rational method of treatment for those that are not benefited by it.

It is to be hoped that in the near future some one of the many research workers will isolate the actual cause of endemic goitre. That the disease is becoming more prevalent no one can doubt, and until the actual cause is known, treatment must of necessity be empirical. Whether the disease is caused by some infective organism or by some specific bacteria we do not know, but that drinking-water carries the active agent is the consensus of opinion of investigators. Assuming that the disease is caused by an infection, the method of treatment as outlined later is taken from the realm of empiricism and may be classed as a specific.

Whatever the nature of the active organism, we know that boiling or distilling drinking-water renders the same innocuous. This, then, is the first step in the medical treatment, and in simple non-toxic goitres of adolescence this alone is sufficient to cure.

Should the enlargement not disappear under this treatment, the Gunn method should then be used. This consists of the use of iodine externally and internally for a period of not more than four weeks. The iodine is then stopped and a 5-per-cent phenol solution is injected into the gland substance, one or two injections of 60 to 100 minims being usually sufficient to effect a permanent cure.

One should keep close watch of the patient while she is taking the iodine, as a non-toxic goitre may become toxic from the use of iodine. Moore had one develop an exophthalmos with marked nervous and cardiac symptoms, which was relieved only by rest in bed, quinine hydrobromate and ergotin internally until the toxic wave had subsided, when about five-sixths of the thyroid was removed.

Simple hyperplastic non-toxic goitres yield readily to treatment. This is the class that is very common in young women from eighteen to thirty years of age, who are very grateful for the non-disfiguring removal of an annoying blemish.

In hyperplastic toxic goitres use iodine very carefully and for a short time only. Depend on rest, diet, and injections of phenol. If improvement is not marked early in the treatment, discontinue and advise operation.

On cystic goitre the treatment has little or no effect. Many of these cases respond to *x*-ray exposures, but as a rule operation will be necessary.

As already indicated, one must select the cases suitable for the Gunn treatment. To waste time with a markedly toxic goitre would be criminal. In such cases nothing but the early removal of a large portion of the gland is going to save the patient or prevent serious degenerative changes in myocardia and kidneys.

If the patient is seen during the toxic wave put her in bed, give no drinking-water except that which has been boiled or distilled, clean out the intestinal tract, put on meat-free diet, and give quinine hydrobromate gr. 5 and ergotin gr. 1 four times a day. Inject boiling water into the

gland if no improvement follows or if toxemia is increasing, and the heart action so bad that operation is not advisable. Tying one or both superior thyroids under local anesthesia will tide the patient over the toxic wave when she can be operated upon with comparative safety, while she surely would have died if operation had been performed during the height of toxemia.

Moore has treated a series of forty cases which include simple, hyperplastic atoxic, hyperplastic toxic, cystic, non-hyperplastic atoxic, and non-hyperplastic toxic. Eliminating the cases that were so toxic that they were operated on as early as consistent with safety, his percentage of permanent cures is a fraction over 90. He realizes that the number is too small to be of much value, yet the results were so encouraging that he will continue the treatment until he is convinced that there is a better method.

The Technique of Injection.—He uses a Record or a Luer syringe of not less than 5-Cc. capacity, to which is attached a needle two inches long of small caliber. After boiling needle and syringe, the site of the injection, usually over the isthmus, is touched with iodine. The skin is picked up with the fingers and brought well up on the shaft of the needle before inserting into the gland substance. The mass of the gland is then located by palpation, and frequently may be grasped and held while the needle is introduced into the substance of the gland. The patient is asked to swallow. If the needle is properly inserted, it will move with the tumor mass during the act of deglutition. Then slowly inject from 60 to 100 minims of the 5-percent phenol solution into the gland substance. The patient will have a feeling of faintness lasting about one to two minutes. The only pain is that of the ordinary hypodermic injection. There is a slight reaction to the injection, noticed by a feeling of soreness and a slight swelling of the gland. This completely subsides in a few days, and it is advisable to wait a week or ten days before repeating the injection. By measuring the neck one will notice a continual decrease in size until all enlargement has disappeared.

Frequent examination of the urine is necessary to guard against a possible nephritis. If the gland is still enlarged after ten or twelve injections it will be useless to continue the treatment.

From Moore's experience with the series of cases he has drawn the following conclusions:

1. Hyperplastic, non-toxic goitres respond most readily to this treatment.

2. Where toxemia is present use iodine guardedly and for a short time only. If improvement is not marked early in the treatment, discontinue and advise operation.

3. On cystic goitres the treatment has little or no effect.

4. Exophthalmos cases are best treated by rest in bed, quinine hydrobromate and ergotin internally, with operation as soon as the toxic wave has subsided.

GONOCOCCUS VULVOVAGINITIS IN CHILDHOOD.

In the *American Journal of Diseases of Children* for May, 1917, GITTINGS and MITCHELL point out that the treatment of gonococcus vaginitis in children involves the use of local remedies and vaccines, and general constitutional measures. Most authors make use of some form of local treatment, some few believing that persistence in reliable technique will result in cure, although admitting that much time and patience are required. Wolff opposes local treatment in those past infancy on the score of its demoralizing influence. Rygier enlarges on its difficulties and the lack of permanent results.

Adkins believes that the disease runs its course in spite of all one can do to cure it. Certain local measures he finds of temporary benefit. Among these is the injection of suspensions of living lactic acid bacilli.

Whitehouse also has treated eight patients with cultures of lactic acid bacilli without the use of other measures. He

obtained cessation of discharge and disappearance of gonococci and septic organisms in from fourteen days to three weeks. He does not know whether or not these results are permanent, however.

Taussig believes in rest and general tonic treatment. He does not believe in irrigations, but prefers instillations of a solution of argyrol, 25 per cent, in the early stages; later a 1-per-cent to 4-per-cent solution of nitrate of silver. Silvol may also be employed advantageously.

G. G. Smith advocates mechanical cleanliness by means of irrigations with potassium permanganate, 1:4000, and the prolonged use of silver salts, such as argyrol (or silvol). He continues these treatments for one month after all discharge has disappeared.

Perrin has treated over 100 cases during the last ten years with injections of protargol 5, water 8, glycerin q. s. ad 50. He claims that all were radically cured within fourteen to twenty days. Most of the cases were chronic and had received a variety of other forms of treatment.

The most elaborate technique is described by Norris, as follows: The child is put in the Sims or knee-chest position. The hymen usually must be sacrificed. The vagina is washed with weak potassium permanganate and swabbed with 25 per cent argyrol solution. It is then thoroughly dried with strips of gauze, and the drying completed with an empty atomizer. The child is kept in the Sims position for twenty to thirty minutes to allow air to enter the vagina. Finally the vagina is flooded with a weak solution of silver nitrate, gradually increased in strength, and glycerin added. The above treatment is carried out three times a week. In the interim the mother or nurse uses a weak permanganate or argyrol solution introduced with a soft-rubber ear syringe. By this method Norris cured fourteen patients in an average of twelve weeks, the longest time being eighteen weeks.

Willcox, after trying all methods of treatment, believes that the disease is controlled but not cured. Fisher has abandoned treatment other than the use of irrigations of magnesium, alum, and water. He also advocated the use of general tonic treatment, namely, change of air, arsenic, cod-liver oil, and iron.

Rubin and Leopold insist on the importance of determining the extent of the deep lesions before beginning treatment. For this purpose the electrically lighted female urethroscope should be employed. When irrigations are resorted to, the douche tips should enter the vagina for at least 1½ inches. Applications by swabs used without the urethroscope are injurious and useless. When strong silver solutions are applied to the cervix and vagina, it is well to keep the child in bed for a few days.

Barnett also advocates the use of the electrically lighted urethroscope in the treatment in order to apply the medicament directly to the cervix. This he considers important, as the involvement of the cervix is not easily amenable to the ordinary douche or irrigation. He prefers Lugol's solution 1:500. With the use of the urethroscope he obtains a cure in a month; whereas at the end of six months only seven of his twenty-six patients undergoing prolonged systematic treatment were cured by ordinary irrigations.

Freeman states that local treatment should not be limited to one method, as a change often brings good results. He also believes in the use of the endoscope.

Kerley sounds a timely warning that a large number of cases should be studied before reporting results from any form of treatment, as occasionally a run of mild infection occurs, and the physician, in such an event, becomes unjustifiably enthusiastic about his method of treatment.

One of the most ardent advocates of the use of vaccines is B. W. Hamilton, who treated eighty-four patients with 90 per cent of cures in an average time of fifty days. These figures he contrasts with 260 patients treated by irrigation alone, in whom there were 60 per cent of cures in an average time of 300 days (ten months). He used two stock vaccines and one freshly prepared from an eighteen-hour blood-agar

culture taken from an adult male with urethritis. Apparently local treatment was not used.

UNPARALYZED CASES OF ACUTE POLIOMYELITIS.

The *New York State Journal of Medicine* for June, 1917, contains an article by BOWEN on this important topic. He points out that in mild cases in children there may be nothing to suggest the diagnosis. Definite signs do not appear at once. Afebrile cases are rare. Headache is the second most common symptom. Pain in the neck, back of head, spine, and extremities is common. Bending the neck to the chest is painful and resisted, so that one can often lift a child to the sitting position by the back of the head. Lifting the child by head and buttocks causes painful anterior bending. This is Draper's spine sign. The head is often somewhat retracted, a condition which will be noticed at first glance. Convulsions may occur at any time during the acute stage.

Where meningeal symptoms predominate there is marked headache, anterior and posterior rigidity varying from slight stiffness of the neck, which prevents flexing the head on the chest, to retraction of the whole spinal column and opisthotonus, and when severe there may be twitching, jerking, tremor, convulsive movements, and true convulsions. Reflexes may be exaggerated in the early and preparalytic stage. The patellar reflex may be lost with no other sign of paralysis. Kernig's sign is sometimes found. McEwen's sign is elicited by percussing and auscultating the cranium, and is due to distention of the ventricles by the spinal fluid. Ruhräh considers the following sign important: "If the patient is raised by placing the hands under the shoulders the head will fall back. If the child is told to raise the head when it is sufficiently conscious, it will do so and hold it forward a moment or so, and then the head will fall back." Mentally there may be depression, apprehension, prostration, restlessness, anxiety, confusion, or emotionalism.

Painful symptoms may predominate. Some form of pain is almost constant. Tenderness may also be present. Headache is usually basilar or occipital. Pain along the neck and spine are very characteristic. The shoulders and limbs may have influenza pains. Myalgia often precedes and accompanies paralysis.

Gastrointestinal symptoms predominate in certain cases, due to a marked paresis of the organs of digestion. Anorexia, vomiting, foul breath, sordes, diarrhea, stubborn constipation, colic, and gas may all follow. The vomiting is often sudden and repeated. It may rarely be violent and constant. Constipation is nearly always present. It is sometimes preceded by diarrhea. Frauenthal believes diarrhea is more usual in arrested cases. Constipation sometimes persists for a considerable period. The tongue is usually red at first, then coated, and later covered with sordes.

The urine is scanty and highly colored, and sometimes contains albumin. Retention is not uncommon, due to a paresis of the bladder walls. Sometimes prolonged catheterization is required.

The skin shows a multiform rash in about ten per cent of cases. Sweating is fairly common and hyperesthesia is usually present. There are sometimes vasomotor disturbances, erythema, blushing and paling over larger or smaller areas, often more marked in the paralyzed part.

The duration of the preparalytic stage may be from twenty-four hours to twelve days. The temperature is elevated from five to seven days; the pulse usually remains rapid after the fever has disappeared. The other symptoms may occur in any combination or permutation and may subside at any time or at any stage of the disease, from the slightest malaise to the severest paralysis.

If no paralysis develops, the case is called abortive or arrested. Severity of symptoms has no bearing on the degree or extent of paralysis which may develop. In fact abortive cases may show very severe symptoms. Convalescence is usually rapid, but may be slow; vague symptoms,

weakness, and pains persisting for some time. Muscle weakness may sometimes be found by the use of Lovett's tests.

Of the value of lumbar puncture Flexner says: "Lumbar puncture in 90 per cent of cases gives a definite diagnostic result. Irrespective of the severity of the symptoms, lumbar puncture yields, in cases of poliomyelitis, a fluid, usually clear, but showing either morphological or chemical changes, or both. The mononuclear cells tend to be increased and globulin is usually present. These changes in the cerebrospinal fluid, especially during periods of epidemic, should be regarded as presumptive evidence of poliomyelitis infection."

Where meningeal involvement is suspected, lumbar puncture should be done as soon as possible, as it not only clears up the diagnosis but relieves pressure symptoms. Bowen found it of great value to examine the fluid at the bedside, leaving the needle in place to give serum if indicated.

In the technique of lumbar puncture Zingher recommends a No. 18 gauge needle 3 inches long. This should have a tightly fitting obturator and fit standard connecting parts so that it may be used for giving serum. It should be kept sufficiently sharp to produce a minimum amount of pain. A small circle of skin infiltration with novocaine or weak cocaine will help in handling young and nervous patients.

The child should be laid on a table and the back held firmly arched by an assistant. For many reasons it is usually not desirable to have the family present. The needle is introduced vertically in the midline midway between the third and fourth lumbar vertebræ at the level of the crest of the ilia. There is nearly always a recognizable sensation as the needle passes through ligament, soft tissue, and finally almost pops through the dura of the canal. In spite of the utmost care some backs seem to put up a solid wall of bone that defies one's efforts, and occasionally a meningeal vein will be pierced, resulting in bloody fluid.

The cerebrospinal fluid is abnormal in practically every case, and diagnoses based on fluid findings were found to be reliable in all of the author's cases in the 1916 epidemic. It may present a number of changes, which taken in connection with the clinical findings make spinal fluid examination an invaluable aid to diagnosis.

The fluid is sterile to ordinary culture methods and no organisms are found in stained smears. J. A. Kolmer reported microörganisms in the spinal fluid at the Philadelphia County Medical Society in November, 1916. J. W. Nuzum, of the Cook County Hospital, has reported finding streptococci in fifty cases in October, 1916.

The fluid is almost always under increased pressure when drawn, though it rarely spurts. Fifteen cubic centimeters may be drawn from an infant and sometimes 50 Cc. or more from an adult before the pressure is reduced to normal. Bowen found the fluid nearly always sparklingly clear.

Albumin is present in increased amount. Globulin usually gives a marked reaction; it is not present in normal fluid. Fehling's solution is promptly reduced by polio fluid and by most other spinal fluids (except in cerebrospinal meningitis.—Ed.). In examining for cells an acetic acid diluent should be used to destroy red blood cells, and a stain may be added. There is an increased number of cells from the normal 5 to 10 up to several hundred to the cubic millimeter. At first polymorphonuclears predominate, but later there may be as high as 90 per cent lymphocytes. Bowen found also large mononuclears and large irregular cells which are possibly endothelial in origin.

The fluid in the later stages shows a persistence of albumin and globulin for eight or ten weeks. The cells rapidly return to the normal number, though they may persist.

Occasionally a fibrin web forms in or on the fluid after standing a short time. This is characteristic of polio when present. Blood is sometimes present, due to injury of vessels in the canal. When due to hem-

orrhage in the cord itself, the fluid is usually homogenously red instead of clearing as more is drawn. The fluid may be yellow in cases in which there has been hemorrhage a few days previously.

Zingher places much diagnostic importance upon the slight opalescence of the fluid even early in the disease, which gives a ground-glass appearance throughout the fluid when examined in a clean test-tube by transmitted light, due to cells in suspension. Normal fluid looks limpid, like distilled water. Bowen advises precaution against blood cells which in small numbers produce this appearance, and also against leucocytes in other forms of meningeal inflammation. A microscopic examination should not be neglected whatever the macroscopic appearance. Zingher gives a second macroscopic test which he believes to be of value, namely, the foam test, which depends on the increase in albumin. On shaking half a test-tube of fluid a heavy and persistent foam forms which may last half an hour. On normal fluid the foam is light and evanescent.

DIVIDED BLOOD-VESSELS AS AIDS TO ACCURATE WOUND CLOSURE.

Andrews (*Surgical Clinic of Chicago*, April, 1917) dwells with some insistence upon the accurate adjustment of tissues for rapid, clean wound healing, holding that faulty apposition and faulty repair in the deep layers of the skin and below the skin cause broad scars. He regards suturing together the ends of divided vessels as the best means of insuring proper alignment. He states that we know no limit to the perfection of healing which follows minutely accurate closure. He has several times had to regraft torn-off pieces of tissue, usually skin, as a bit of finger, or, in one case, the tip of the nose. If clean, these fit with an accuracy which no new graft can approach. Such pieces carefully fitted to their old bed commonly unite so smoothly as to make the line of union nearly invisible. No graft from another part or another patient ever forms such a perfect implant.

He considers a study of cut vessels as the surest means of identifying the exact longitudinal position of wound edges. That is, by uniting each cut branch to its fellow you obtain perfect wound adjustment true in all three dimensions—the length, breadth, and depth of a wound.

THE RELATION OF STRUCTURE TO FUNCTION AS SEEN IN A MECHANISM OF THE VENOUS SYSTEM.

Wood Jones (*Lancet*, April 14, 1917) recalls the fact that the primary elements of the tubular vascular system are primitively pulsatile, and this pulsatile power is manifested at an extraordinarily early period. Jones refers to Wharton Jones's observations on the pulsation of the veins coursing in the membranes of a bat's wings, which contracted on an average ten times every minute. The pressure exerted by the surrounding skeletal muscular masses is the chief agent in propelling blood along the veins. There is a generalization which amounts to the statement of a definite law of animal economy that venous channels which run their course in the midst of muscle masses are multiple; and that when emerging into intermuscular spaces these plexiform vessels unite to form single channels again. This might be translated into the terms of anatomical nomenclature by saying that arteries are accompanied by single veins in intermuscular spaces, but are accompanied by irregular and multiple venæ comites when passing in intramuscular planes.

When the muscular system is entirely relaxed, as in sleep, the heart will propel blood to its distal arterial ramifications, but the absence of muscular contractions will impede its return to the heart; venous blood will, therefore, tend to accumulate in the relaxed distal parts. In this way a large proportion of the blood of the body may become lodged in the venous system. Upon waking this blood must be returned to the heart to insure the proper arterial supply to the brain and other organs. It is for this reason that muscular contractions of the

limbs—the familiar stretching—accompany the waking of such animals as sleep lying down in a state of muscular relaxation. Yawning, by causing a suction in the thorax and a compression of the abdomen, attains the same ends. The blood is squeezed home from outlying parts into the cavities of the body, and finally to the heart. It is noteworthy that animals which do not lie down to sleep, or do not thoroughly relax their muscles in sleep, do not stretch or yawn when waking.

One other effect is of peculiarly human interest. If the legs are dependent, but are not engaged in any special muscular activity, venous blood will tend to gravitate into the veins. The deep intramuscular veins are supported by the musles and cannot overfill, and there will therefore be a tendency for the superficial veins to become distended with blood. This is the etiology of varicose veins in sedentary persons. On the other hand, if the intramuscular veins are vigorously and continuously compressed by muscular action, the burden of returning the venous blood will again be thrown upon the superficial veins. This is the etiology of varicose veins in athletes.

LARYNGECTOMY UNDER NERVE BLOCKING.

MALCOLM HARRIS (*Surgical Clinic of Chicago,* April, 1917) accepted and operated upon a patient with extensive carcinoma, performing radical laryngectomy. The diagnosis of advanced carcinoma was unmistakable, but the stenosis was so marked and the dyspnea was so intense that an operation was imperative. A major operation was performed on the basis that it afforded a slight element of hope and that it is but little more difficult than a tracheotomy, since under nerve blocking it is robbed of most of its difficulty and becomes quite simple. The nerve supply to the anterior region of the neck is well adapted to nerve blocking, and almost all operations involving this region can be performed by this method with great satisfaction. To block this region the needle is inserted just behind the middle of the posterior border of the sternomastoid muscle. The external jugular vein usually crosses this muscle at about that point, so that the needle usually enters just above and behind the point of crossing on the vein and the posterior border of the muscles, but the vein varies somewhat at times, so that it alone is not a reliable guide. The vein, however, should be identified before inserting the needle, so as not to puncture it and thus inject the solution into the vein. The point of the needle should lie just beneath the deep fascia in immediate proximity to the branches of the superficial cervical plexus.

The needle being now inserted 25 Cc. of the novocaine-calcium-magnesium solution were injected on either side of the neck; 10 Cc. of the same solution were next injected on either side, near the outer end of the hyoid bone. In less than five minutes there was a complete anesthesia of the entire region of the neck. An incision was made along the midline of the neck from just above the hyoid bone to the suprasternal notch, and, on account of the enlarged glands on the left side, a transverse incision was made near the upper end parallel with the hyoid bone. The longitudinal incision was carried down at once to the thyroid cartilage above and to the trachea below, exposing the isthmus of the thyroid, which was doubly ligated and divided and the lateral halves pushed aside. A loop of strong silk was passed around one of the cartilaginous rings of the trachea, the trachea completely divided above that ring, and the lower end of the trachea drawn out at the lower angle of the wound. A few drops of the novocaine solution were then injected into the mucous membrane of the proximal end of the trachea; there was no evidence of tracheal irritation, no tendency to cough, and no change in the rate or character of the respirations after treating the trachea in this manner. By means of the silk loop about the ring of the trachea the end of the trachea could be easily drawn forward out of the lower end of the wound so there was no interference with respiration. The advantage of not being bothered by the anes-

thetist at this point of the operation was very apparent. On account of the dissection of the upper anterior triangle of the neck, which was planned, he turned down and out skin-flaps at the upper angle of the incision.

He then proceeded to dissect out the larynx completely, including the tissues and lymph-glands on either side above. On dissecting posteriorly he reached the region of the esophagus and the pharynx, without causing any pain, but cutting the wall of the pharynx was painful. This was expected, as this region is not supplied by the cervical plexus, but by the glossopharyngeal nerve, so a few drops of novocaine solution were injected along the wall of the pharynx so as to block this region. In doing this one should be careful not to block the pneumogastric nerves. Having made this injection, the patient gave no further evidence of pain. The larynx was completely removed, including the epiglottis and the surrounding tissues. He was able to close off the pharynx in front with catgut. A drain was placed in the upper end of the wound and the skin closed down through the lower angle, where he brought the proximal end of the trachea to the surface and carefully sutured it to the skin, leaving the opening free without the introduction of a tracheal tube.

The patient was placed in bed and allowed to sit up at once, and fed for a few days through a tube.

Any one who has undertaken, or even witnessed, an operation for the complete removal of the larynx under general anesthesia cannot fail to be impressed by the ease and facility with which the operation can be performed under nerve blocking. There is no difficulty with respiration, no trouble or annoyance with the anesthetic, and the patient's general condition at the end of the operation shows that there has been practically no shock. His pulse was 90 before starting the operation, and it was only 100 at the termination, the quality and fulness remaining about the same. It was quite evident from his actions during the operation that he suffered no pain, and this, too, notwithstanding the fact that he had no morphine, scopolamine, or other anodyne before the operation, showing conclusively that the anesthesia and freedom from pain were due entirely to the nerve blocking.

TREATMENT OF OSTEOMYELITIS.

SIMMONS (*Boston Medical and Surgical Journal*, May 10, 1917) contributed a paper on this subject two years ago in which he reached the following conclusions, nor is he now prepared to change the views thus expressed:

In children with pain in a limb and evidence of toxemia, always consider osteomyelitis.

Operate early, even if the symptoms are rather vague. If the diagnosis is incorrect, practically no harm is done; while if correct, a great deal of suffering may be avoided.

In acute cases, open to the medulla and pack the wound. Prognosis good. The treatment and prognosis vary of necessity somewhat in these early cases, but in general the earlier the operation the better the prognosis.

In cases in which bone destruction has taken place, seen less than three months after the onset of the disease, perform subperiosteal resection when possible. Prognosis good.

In chronic cases of bone abscess of less than one year's duration, open and pack. Prognosis good.

In chronic cases, with bone destruction of less than one year's duration, remove sequestrum and pack. Prognosis good.

In old chronic cases, either with bone destruction or of the bone abscess type, remove necrotic areas and drain. Try to obliterate the cavity with flaps of living tissue. If this cannot be done, either use bone wax, pack, or sterilize the cavity, allow it to fill with blood-clot, and close without drainage. The prognosis, if the cavity can be obliterated, is fair, otherwise poor.

The treatment, when such bones as the pelvis are involved, is unsatisfactory, and the prognosis problematical.

When, in old chronic cases, the whole shaft of a long bone is badly diseased, the possibility of resection of the entire shaft, with bone transplantation, should be considered before amputation is resorted to.

His cases were treated in the routine way, and operated upon as soon as the disease was suspected. A tourniquet was always used, as with it a much better idea of the condition of the bone may be obtained. It is also of value in preventing fat embolism which is seen after bone operations. To the writer's knowledge he has never seen a case. An incision is carried through the periosteum, and an opening made into the medulla with a burr or trephine. This should always be done, even if there is pus in the soft parts and under the periosteum. If the medulla is diseased, an opening should be made below the first, and still others below this until normal appearing marrow is reached. Never curette, as this spreads the infection and destroys any endosteum remaining alive. The wound is then packed. If the bone dies, a second operation, subperiosteal resection or sequestrotomy, is done in from four to ten weeks, depending on the bone and the rapidity of formation of the involucrum has formed, following the changes necessary to wait until considerable involucurm has formed, following the changes with the *x*-ray, but the sequestrum should be removed at the earliest possible moment. Other minor operations for the removal of small sequestra, which have formed later or which have been overlooked, are the rule, but if the case is carefully followed they can be done early and amount to little.

The results of these cases show the value of early treatment. Of the fourteen acute cases, two died at once of septicemia and two have not been traced. Of the ten, prompt operation resulted in cure without bone destruction in three, and the other seven are well from one to two and a half years after the second operation of sequestrotomy or resection. Of eight cases seen from one to four months after the onset of the disease, six are well, one has not been traced, and one, a femur, is still draining—the author states that he doubts if he will ever be well.

Diagrams and clinical histories follow. He notes that cases seen within a few weeks from the date of onset should be cured by operation. One operation is usually insufficient, and two or more are often necessary.

At the first operation, however, some idea of the prognosis can be obtained, and a more or less definite plan for further operations determined upon.

Osteomyelitis of the ilium or femur is difficult to treat, and the hope of a cure is much less than when other bones, as those of the forearm or leg, are diseased. Multiple osteomyelitis is exceptionally difficult to cure, but each bone should be treated as if it alone were the only one affected. Infinite pains and patience are necessary to cure any case, and it should be followed up very carefully, especially during the first year, and *x*-rays taken at frequent intervals.

THE USE OF RADIUM IN POSTOPERATIVE CONDITIONS.

HARRISON (*International Journal of Surgery*, April, 1917) believes there is sufficient clinical evidence to prove the postoperative importance of radiation. The application should be done at once. He advises that these postoperative radiations play important rôles in the treatment of cancer of the vagina or vulva. He believes that certain types of sarcoma cells are more readily influenced than others; small round-celled sarcoma and the lymphosarcoma respond more readily; while Morson holds that if growing from tissues other than bone the spindle-celled sarcomata respond as readily as do the round-celled.

In treating the uterine cases the more penetrating rays are used, thus avoiding the irritating and destructive action of the softer rays. Unpleasant toxic reactions follow long exposure to heavy doses. An exposure of from 600 to 750 milligram-hours, repeated at intervals of four to six weeks, has been found to be adequate. It is held that cancer of the rectum when

inoperable offers a particularly favorable field to the use of radium. This, however, is not in the least in accord with clinical experience. The basal-celled epithelioma or rodent ulcer responds so satisfactorily to the action of radium alone that operative measures are seldom necessary for its treatment. Occasionally to expedite matters the thick, beaded edge may be curetted, after which the application of radium soon results in healing with very little and hardly noticeable scarring. It is advised to excise first the squamous-celled epithelioma if the growth appears to have invaded the subcutaneous tissues, followed by subsequent raying of the part.

As to the physics and methods of application of radium. As used in therapeutics, one of its salts, usually the bromide or sulphate, is employed. The changes produced depend upon the energy given off by the salt in the form of rays, which are of three kinds, called the alpha, beta, and gamma rays. The alpha rays are really positively charged atoms, material particles, about twice the size of one atom of hydrogen. They form about 90 per cent of the total radiation, and are projected with a velocity of about twenty thousand miles per second, but as they have very little penetrating power, being easily stopped by a thin piece of paper or rubber, they do not ordinarily have much therapeutic value. The beta rays are negatively charged particles, projected with the velocity of light. They are almost identical with the cathode rays liberated in a vacuum tube. About 9 per cent of the radiation is formed by these rays, which vary in their penetration, so that various gradations from "soft" to "hard" beta rays are encountered. The gamma rays form about one per cent of the whole radiation, but they have great penetrating power. They will traverse quite readily as much as ten centimeters of lead. Their velocity is that of light, and they are a pulsation of the ether, being similar to the *x*-ray, from which, however, they differ in their far greater penetrative power.

By interposing screens of aluminum or brass of varying thicknesses the passage of different rays can be prevented, so that only the desired kind of radiation may be allowed to pass and exercise its therapeutic effect.

As supplied by the manufacturers radium apparatus is in two forms, the flat applicator and the tube. In the former the radium salt is spread out on a flat surface, and gives out its rays only in the one direction. For applying to large surfaces this is the best type of applicator. In the latter, 10, 25, 50 or more milligrammes of radium are enclosed in a platinum tube, which can be inserted directly into a tumor mass or into the various body cavities.

No absolutely satisfactory method of estimating the dosage of radium has as yet been determined. Many observers use the milligram-hour method, as suggested by Dr. Dawson Turner, while others prefer simply to state that they have used an applicator containing so much radium for a certain period of time.

INFECTIONS OF THE BLADDER, WITH SPECIAL REFERENCE TO LOCALIZED RESISTANT AREAS OF CYSTITIS.

GERAGHTY (*Surgery, Gynecology and Obstetrics*, June, 1917) observes that the management of a case of simple acute cystitis, as far as the diagnosis and treatment is concerned, seldom entails any difficulty. An examination of the urine in conjunction with the history and symptoms is usually sufficiently definite. The treatment is comparatively simple. Our main endeavor in the treatment of these cases should be to place the bladder at rest as much as possible, and this is done in two ways: First, by the liberal employment of sedatives, resorting if necessary to the plentiful use of morphine, or preferably pantopon; secondly, the decrease of the bladder activity by decreasing the amount of water ingested. The mistake is frequently made of forcing water on these patients. If one were to purposely adopt a procedure which would aggravate the condition he could not select anything more efficacious. The water should be decreased to the absolute

needs of the individual, so that the bladder will not be constantly obliged to expel the rapidity accumulating urine. In order to combat the increased acidity of the now concentrated urine, alkalies should be given to the point where the reaction becomes alkaline. Urotropin is useless; if the urine is allowed to remain acid, the formaldehyde liberated would but add to the irritation, and if it is rendered alkaline the urotropin will not be decomposed and consequently no formaldehyde will be present. The use of the drug in acute cystitis cannot be said to have much value.

Active treatment, such as instrumentation, irrigations, and instillations, during the acute process is usually more harmful than beneficial. When the symptoms do not subside and the infection persists, it is usually an indication that there is present some complication which is responsible. In such cases a careful investigation must be made to determine this factor. In some it will be found that the cystitis is but an expression of a renal infection above, or there may be some malformation or deformity in the urinary tract which is not allowing complete emptying or evacuation of the vesical contents.

In the vast majority of chronic or long-resisting infections of the bladder, it will be found on investigation that the infection is secondary really to some other focus in the genito-urinary tract. Every one is familiar with the rapidity with which a cystitis will clear up when an unsuspected stricture or a pyelitis is discovered and properly treated. At other times the infection is dependent upon some form of obstruction at the vesical orifice. Occasionally the cystoscope will reveal the presence of a diverticulum which has become infected, and owing to the lack of proper muscle in the diverticular sac, the contents of the sac are never completely emptied and it serves as a reinfecting focus for the bladder itself. A small series of recurring and persistent urinary infections, recently reported by the writer, which had stubbornly resisted all efforts, were finally entirely cured by opening and drainage of the seminal vesicles, the latent infection in these organs keeping the bladder infected. Occasionally an infected utricle is discovered, and elimination of the infection from this source is followed by disappearance of the infection from the urinary tract, or again the prostate is at fault.

It is now pretty thoroughly understood that before one can begin the intelligent treatment of an infection of the urinary tract an investigation of the whole tract must be undertaken. In most cases the successful treatment of a case of chronic cystitis will depend upon the ability of the physician to locate the intravesical or extravesical factor which is responsible for the continuance of the infection, and in most instances if this factor can be rectified the cystitis will promptly be cured. The treatment of chronic cystitis has largely become a matter of treatment of associated conditions or lesions, and our ability to give a prognosis in any particular case will depend upon the possibility of removing the contributing cause.

We are obliged to admit, however, that in a definite number of cases the failure of the vesical infection to disappear spontaneously is not due to any extravesical factor. These form a very interesting group of cases. In most of them the disease is not a diffuse cystitis, but a localized affair with normal mucous membrane lying between the infected areas; the areas may be single or multiple. Sometimes the lesion is a localized area of reddening and hyperemia; at other times there is edema of the mucous membrane, and even the formation of bullæ, and at times superficial ulcerations are observed. When the lesion involves only the mucosa and to a slight extent the submucosa, simple irrigations with silver nitrate or other silver salts, particularly if the bladder is overdistended with the irrigation at each treatment, will very promptly lead to disappearance of the infected areas. Where, however, these localized areas of cystitis involve markedly the submucosa and to a slight extent the muscle of the bladder-wall, irrigations used in the ordinary way have comparatively

slight influence. For the treatment of these resistant areas of cystitis, the writer has been using during the past two years a particularly efficacious method, which is as follows: The bladder is filled with salt solution, and then a ureter catheterizing cystoscope is passed and an ordinary ureter catheter without the side eye, and with the end cut square, is passed into the bladder. The tip of the catheter is then placed against the area to be treated, and a 10- to 20-per-cent silver nitrate solution injected directly on the area. In this way it is possible to secure a local application of a very strong solution, and at the same time not irritate the rest of the bladder.

The excess of silver is immediately neutralized by the salt solution and the effect of a strong application is secured on the area desired. In women, by means of the Kelly cystoscope with air distention, the application of strong solutions to localized areas is, of course, readily made, and the results obtained by this method have been indeed most gratifying. In the male by the method above the same therapy is attained. In some instances in which the lesion is particularly resistant, he has fused a silver nitrate point to the end of a metal-tipped ureter catheter, and it is possible in this way to paint the desired area with the silver nitrate stick itself.

WAR-SURGICAL IMPRESSIONS GAINED IN FRANCE.

GUILDAL (*Kriegschirurgische Eindruecke aus Frankreich; Hosp.-Tid.*, Kjobenh., 1916, lix, Nos. 27 and 28) discusses his impressions and experiences gained in French hospitals. He visited among others Compiegne; the experimental station of Carrel; Montdidier and its hospital, which admits exclusively thoracic, abdominal, and cranial injuries; Amiens, with its special hospital for face and neck injuries.

Infection is the dominant factor in military surgery, especially now with the long-drawn-out trench warfare. Of the small, medium-sized, and large injuries, the small are almost never, the medium-sized usually, and the large or severe injuries invariably, infected. As also in Germany the number of artillery wounds has increased enormously with the trench warfare. The time elapsing between the injury and the beginning of treatment is the important element in the infection of wounds.

The author discusses the disposition of the wounded from the trenches. The wounded are first taken to the "poste de secours," where only severe hemorrhages are checked, tracheotomies performed, and fractures immobilized. After that the wounded are taken to the "poste de pansement," then to a distributing center. The slightly injured are taken to a hospital near the front. The moderately severe injuries are taken to an evacuation hospital, and the severest to the surgical ambulances, usually 5 to 10 km. from the front. Here all operative procedures can be undertaken. After that the injured are taken to the base hospitals.

At the beginning of the war all injuries were treated very conservatively, which later led to very poor results. Antiseptic procedures do not play an important rôle. The expectations of Carrel's method of irrigation with Dakin's fluid were only fulfilled in part.

The important point in the treatment is that the injured person receives medical attention during the first twelve hours, and the wound is opened and thoroughly drained. The wounds are cleansed a little quicker by this method, but a very complicated apparatus is necessary. Since all wounds are now opened widely the infection is less virulent. Gaudie at Montdidier excises the entrance and exit opening like a malignant tumor to healthy tissue and closes the opening per primam. As a novelty the author mentions the fact that Gaudie employs methylene-blue solutions, with the most striking result that all patients, doctors, beds, and the hospital are blue.

With the exception of a few late cases tetanus was not seen. Collargol and vaccine treatment, according to Wright, were employed without any special results.

The statistics given the author by Leriche

are of interest. Following an attack by the Germans upon a trench the author had, among 150 wounded, 30 injuries of the head, 20 per cent; 20 face and neck injuries, 13 per cent; 8 thoracic wounds, 5 per cent; 2 abdominal, 1 per cent; 43 upper extremity, 28 per cent; 27 lower extremity, 18 per cent. Following a French attack there were brought in 38 injuries of the head, 17.3 per cent; 43 of face and neck, 19 per cent; 26 of the thorax, 11 per cent; 4 of the abdomen, 1.8 per cent; 51 of the upper extremity, 23.2 per cent; and 57, 26.8 per cent, of the lower extremity. Among 2334 injuries Leriche saw 229 head injuries, 210 of the face and neck, 179 of the thorax and back, 117 of the abdomen and pelvis, 614 of the upper and 601 of the lower extremity.

The author comments on the fact that since the introduction of steel helmets the number of head injuries has increased considerably. He explains this by the fact that before their introduction many of those injured were killed outright. All skull injuries are operated primarily. Special treatment is accorded to injuries of the lower jaw. Especial mention is made of the flying laparotomy ambulances, consisting of 11 automobiles and 15 physicians, and which in two hours set up barracks and everything necessary.

Quenu reports statistics of Stern showing 300 cases of abdominal wounds treated conservatively with a mortality of 80 per cent, and 260 cases treated by operation with a mortality of 60 per cent.

The author saw but few injuries of urinary organs—two or three bladder injuries. Bone injuries are not treated conservatively as at the beginning of the war. The wounds are opened up, and loose or easily loosened fragments are removed. The danger of pseudarthrosis formation is not great.

Considerable difference of opinion exists regarding the treatment of joint injuries, but it seems that resection is preferred to the conservative treatment. He saw but few aneurisms, and these were treated by ligation. Nerve injuries are common and should be operated upon early. In regard to amputation, everywhere there was marked conservatism. Bullets are removed if they produce disturbances, and the danger of removal is not too great. He observed an attempt to remove a bullet from the lung producing symptoms only on deep breathing—the patient remained on the table. Two shell fragments were sought in vain, and in the posterior mediastinum. The methods of localization are the same as ours.

TRANSPLANTATION OF THE URETER.

Following traumatism and resection of the bladder for cancer, JUDD (*Surgery, Gynecology and Obstetrics*, June, 1917) observes that in 17 cases of cancer of the bladder very satisfactory results were obtained by transplantation of one or both ureters. In every instance when the cystoscopic examination could be made after the transplantation of the ureter, the latter was found open. In two cases the ureter was liberally ligated with the idea of doing a nephrectomy. Later this last procedure was not called for, nor did any harm seem to result from the procedure.

As to the technique, the straight rectus cut was made from the symphysis almost to the umbilicus. The peritoneum was dissected back and the ureter was exposed. In one instance the peritoneum was opened. The ureter was liberated as far down toward the bladder as possible. In each instance, these being traumatic cases, there was much scar tissue and the dissection was continued into it. The ureter was divided between clamps and the lower end ligated with plain catgut. The ureter was liberated from its bed sufficiently to make anastomosis into the bladder free from tension. The end of the ureter was split for a short distance and a small opening made into the bladder wall. In order to hold the ureter in place, each of the two parts of the ureter was stitched by a plain catgut suture to the mucosa of the bladder. The bladder was then accurately stitched around the ureter.

Intravesical transplantation of one of the

ureters in 17 patients suffering from carcinoma has been performed. Thirteen of these patients were males, and four were females. From one-third to two-thirds of the bladder was resected, and the ureter transplanted into the remaining portion. Three of the 17 patients died in the hospital. One lived five days; one, six days; and one, twenty-three days. Eight of the patients survived the operation and have since died. The average length of life was two years and one month. One patient lived seven years.

Five of the remaining six patients are living at the present time, from which it is shown that transplantation of the ureter to another section of the bladder can be performed and the function of the kidney maintained. It seems that this is entirely feasible, that it is the procedure of choice in cases of ureteral fistula, and that it is much to be preferred to sacrificing the kidney.

SECONDARY HEMORRHAGE.

TAYLOR (*Practitioner*, May, 1917) observes that the treatment of secondary hemorrhage is one of the most difficult and anxious problems that come before the military surgeon, and in hospitals dealing with recent gunshot wounds it is an accident of rather frequent occurrence. The cases are almost invariably very septic. The patient is seriously ill from septic absorption, ill-fitted to bear even a slight loss of blood, and often has to undergo a major operation before the bleeding can satisfactorily be controlled. The choice of the method of treatment is often a very difficult one, although in other cases, unfortunately, there is no choice in the matter, and one finds oneself compelled to carry out some treatment that leaves the patient only a very small chance of recovering. The question of the possibility of saving limbs is a problem that is constantly coming up, and often adds greatly to the difficulty in deciding the line of treatment that should be adopted.

Where possible, the wound was opened up and the vessel controlled at the bleeding point. In this way there was less danger to the life of the limb, but in many or most of the cases this method of treatment was impossible. The parts were swollen and infiltrated to such an extent that the relations could not be recognized. The tissues were so friable that they would not hold instruments or ligatures, and the patients were so ill that they would not stand the longer operation of ligature in the wound. Proximal ligature or amputation had to be resorted to. But in cases in which it was possible to expose the artery in the septic area, the results were good, and there was no recurrence of the hemorrhage afterward.

Of all secondary hemorrhages, those occurring in gunshot wounds of the thigh, especially with fracture of the femur, were the most serious. If the wound is in the upper part, necessitating ligature of the common femoral, gangrene almost invariably takes place, and yet most of the patients will not stand an amputation in their toxic and relatively bloodless condition.

Hemorrhage in arm wounds was much less serious. Even when there was considerable sepsis, the axillary or brachial artery could be ligatured without any serious effect. There did not seem to be any greater tendency for the infection to spread after ligature. In two of these cases hemorrhage occurred a second time. In the first the wound was on the inner side of the upper forearm. The ulna was fractured, and the wound was deep, ragged, and septic. The brachial had been tied in France. Hemorrhage again occurred from the depths of the wound. It was considered to be coming from a branch of the ulnar artery, although it was impossible to tell exactly where the bleeding point was. The ulnar artery was ligatured in its upper third, close to the bifurcation of the brachial, as well as in the lower third to prevent recurrent flow, and the bleeding completely stopped.

Gunshot fractures of the jaws were fertile sources of secondary hemorrhage. Many of these were slight and could be treated by

syringing the mouth with cold water, but, on the other hand, when they recurred again and again, it was necessary that something more radical should be done. As it was quite impossible to reach the bleeding point, and often very uncertain which vessel was bleeding—the tongue was often injured—ligature of the external carotid was the operation usually done. When this was done, in no case was there any serious trouble with bleeding afterward. In one case, in which the common carotid was tied, severe bleeding recurred later.

In some of the cases hemorrhage had a tendency to recur again and again. The most remarkable case was one which bled altogether six times, definite measures being taken each time to arrest it.

It is important to deal promptly with these hemorrhages by some radical method in nearly all cases. Oozing, say, from a fractured jaw may be temporized with for a time, but if there is distinct arterial hemorrhage it is a mistake to waste time with packing or any other temporary measure. Bleeding almost invariably recurs, and operation has to be resorted to in the long run, when the patient is less fit to stand it. One is struck with the fact of collapse being out of all proportion to the amount of blood lost. This, the author thinks, is due to the heart, degenerated through septic intoxication, being greatly hampered by even a small sudden loss of circulating fluid.

In the immediate after-treatment, everything was done to give the patient a free supply of fluid. Intravenous saline was hardly ever given, but almost invariably subcutaneous infusion was carried on for twenty-four to thirty-six hours. Rectal salines were also administered, and the patient was given abundant fluid to drink as soon as he recovered from the anesthetic.

Beyond the ordinary cleansing and drainage of wounds, the author considers that little can be done to prevent secondary hemorrhage. Several of the medical officers, however, observed that bleeding seemed to be more frequent in cases in which eusol was being used. It may have been a coincidence, but there were more cases of hemorrhage from the wards where it was being used as a routine. It is possible that it has a digestive effect on the softened walls of the vessels.

KEEPING DOWN FLIES.

The *Indian Medical Gazette* for April, 1917, extracts a paper on this subject by C. G. Moor (*Proc. Roy. Soc. of Med.*, December, 1916). Alluding to the use of arsenic, formalin, and other methods, he states that a sticky mixture can be made on the spot, which is quite as effective as anything that can be bought and very much cheaper. It can be applied to paper, string, old tent-ropes, or wires. The sticky mixture (or "fly-glue") is prepared by painting a hot mixture of two parts by weight of powdered resin to one part by weight of castor oil on to any suitable material. It requires a little practice to make the mixture, which is prepared by heating the ingredients in an old saucepan or dekchi, and stirring all the time with a stick. This mixture is very stiff and tenacious when cold, but when hot it is quite fluid, like ordinary oil-paint. As it is difficult to carry about papers coated with the fly-glue, it is best to apply the glue to wires, for in most camps there is a quantity of wire to be found which comes on the hay-bales. This can be straightened out and cut into 2-foot lengths. An inch at one end is bent so as to make it possible to hang the wires on nails. The mixture can be kept in tins for weeks or months, but it should not be applied to the wires or paper until they are required for use. The wires are painted with the glue, and then placed in a bucket made out of an old cresol-drum; 500 wires can be easily carried by a man. They are hung up on nails in latrines, kitchens, larders, and food stores; in a marquee they can be hung on a string stretched between the two poles at a distance of 9 feet above the ground. As soon as they are full of flies, or in any case not later than after two days, they are replaced by fresh wires, and the old ones are placed in bundles in a low furnace and burned off. They are

then ready to be glued again, and can be used all the season, and then put in a dry place for the following year. In a bell-tent they may be hung with the bent end hooked in each of the three small ventilators; in this position the sticky portion does not touch the tent, nor the poles, nor the men's heads or clothes. There is nothing in the mixture which is attractive to flies, but they like to settle on anything which is dark and narrow, and hanging down.

SPHAGNUM SURGICAL DRESSINGS.

PORTER (*International Journal of Surgery*, May, 1917) notes that moss dressings can be produced and will probably in the end be preferred to all cotton in at least military cases. The British War Office accepts the dressing as official. The dry moss of the proper variety has very marked absorptive powers and holds whatever liquid is taken up far better than absorbent cotton. Moreover if the sphagnum be slightly moist the absorption is very much more rapid than in the case of cotton. As compared with this, a fair average dressing made from sphagnum papillosum will get thoroughly wet in one-third the time required by cotton and will hold sixteen to eighteen times its own weight of water, which is reduced to say twelve times by handling. Exceptionally good moss will absorb twenty-two times its weight of water and will keep fifteen to eighteen when appreciably knocked about, and even very poor moss takes up and holds more water than the best cotton.

When dry it is exceedingly light and elastic, and owing to its open structure dressings are cooler and less irritating than those made of cotton. The dressing will continue to take up the fluid discharges until saturated throughout. The collector should gather only the softest and the close-leaved plants, and when possible should be provided with reference samples of suitable material. The dressing of the required thickness is wrapped in gauze and is sterilized in an autoclave thoroughly before being used; or sterilization may be accomplished by dipping the sphagnum into corrosive sublimate of such strength that after it has been passed through a clothes-wringer and hung up to dry it will retain one-fourth of one per cent of sublimate. Mechanical compression makes transportation easier and does not damage the material under normal circumstances.

INFECTIOUS FIBROSITIS—TRENCH SHIN.

CHAMBERS (*Lancet*, May 19, 1917) describes a new condition common enough among soldiers to justify this term. The symptoms, in addition to pain and tenderness in the lower limbs, are characterized by fever, often high, disappearing in a few days, accompanied by a polymorphonuclear leucocytosis which persists after the fever goes. The common sites of pain are the shin bones and anterior tibial muscles. It is dull, aching, and increased on use, is nearly always bilateral, and is associated with pain in the back. The tibias are extremely tender to pressure. Indeed, this associated with fever is regarded as a diagnostic symptom, often being associated with a neuritis of the upper extremities and pains in the ligaments and around joints. Of further diagnostic value is the prolonged course of the disease, usually from one to three months.

In distinguishing between trench shin and trench fever the picture is not absolutely clear. The best guide as to the progress of recovery is the intensity of the pain. If it gradually diminishes from day to day recovery is expected in from one to three weeks. Treatment is chiefly preventive. It is obvious that one of the first essentials is the avoidance of anything such as tight boots or puttees, which is likely to obstruct circulation. Rubbing the feet and legs, if necessary the whole body, with animal fat or animal oil is suggested. It should be used in considerable quantity and should be of a high boiling point. Daily massage of the parts also seems serviceable. During the acute period rest in bed and various medicines are advised.

An interesting note in regard to the above communication by McCrea (*Lancet*, May 26, 1917) states that he believes that trench fever is due to spirochætæ, the Wassermann being positive in the vast majority of these cases. Thus Riemer obtained spirochætæ in the blood in this disease and cultivated them.

WOUNDS OF THE LUNG IN THE PRESENT WAR.

Archibald (*International Journal of Surgery*, May, 1917), on the basis of about sixty cases seen at a casualty clearing station some five or six miles behind the front-line trenches, and many more observed at a base hospital in France, to which the chest cases were sent, usually five days or more after the receipt of the injuries, contributes an interesting practical paper. He notes that the clinical signs and symptoms varied greatly as the cases were seen at the front or at the base. At the front they usually arrived in the casualty clearing station within three to twelve hours from the injury, although a few, chiefly those suffering from urgent dyspnea and severe hemorrhage, were sometimes kept one or two days in the field ambulance. The striking symptom in nearly all was dyspnea with orthopnea. The patients suffered on the whole very little from severe shock. Their blood-pressure was almost always normal or nearly normal, but the degree of dyspnea was often to the uninitiated quite alarming; particularly was it apt to be so if there were present an open wound in the chest wall, establishing an acute open pneumothorax. Frequently with the movements of respiration blood would pour out in quantities and be sucked back. In such cases relief was most readily got by plugging the wound air-tight, converting the open into a closed pneumothorax, and thus saving the mediastinum. Morphine was the great standby, and its effect was quite remarkable. In some there was noted a most severe and apparently spasmodic pain in the region of the diaphragm, together with intractable cough. These cases were best relieved by heroic doses of morphine. However, and fortunately, neither pain nor cough was a troublesome symptom in the majority of the patients. Their chief distress was from shortness of breath.

On physical examination a hemothorax was found with great constancy, much more so, for instance, than hemoptysis. It is fairly certain that the blood came in most instances from the wound in the lung, but in some it certainly originated in a wound of the intercostal vessel. The amount of blood effused, as shown by percussion, was nearly always sufficient to give dulness up to the angle of the scapula, but frequently it went higher than this, and, rarely, it filled the whole chest.

Fever was constantly present. When infection remained absent it usually did not go above 101°, and came down to normal in four or five days. In some cases moderate fever would last eight, ten, or even fourteen days, without repeated punctures finding any infection.

The improvement of the patients in the first day or two, after being put to bed, was often remarkable, particularly in the dyspnea. They learned to regard their chest cases as not being, on the whole, anxious ones; nevertheless, in perhaps three or four per cent the patient would die, of cardiac as well as respiratory failure, from the accumulation of air and blood in the chest cavity. This happened in two of the sixty odd cases seen at the front. They were difficult, within the first twelve to eighteen hours, to distinguish from the ordinary dyspneic case which gets better, and in the rush of a large convoy they both slipped past and died without the obviously necessary operation of a thoracotomy. One of these was certainly a valvular pneumothorax; at post mortem air under tension was found in one side of the chest. This condition is certainly a rare one. In fact, pneumothorax in general was remarkable by its absence. It may be, as Prof. C. P. Howard suggests, that small amounts of air are frequently present in the first two or three days, but are unrecognized; but if so, the fact remains that careful physical

examination at the front as well as at the base usually failed to yield any signs by which pneumothorax could be established. It is true, as they found at the base, from their work in injecting oxygen following the aspiration of blood, that the text-book signs of air in the chest were not to be got in many cases.

Operation in the casualty clearing station was very rarely necessary. The patients were usually kept five days or more for safety, and were then sent down to the base. During these few days infection seemed to be decidedly infrequent. If present, it was not apt to go ahead fast enough to render diagnosis obvious, and most empyemata were operated upon after reaching the base. From letters recently received, better work is now being done in the way of early exploratory punctures and bacteriological investigation, with the result that early empyemata are being found and operated upon more frequently.

Their experience at the base was in many respects quite different from that just described. The patient usually arrived in fairly good condition with little if any dyspnea, largely recovered from the distress of the first few days, and with a hemothorax which had reached its maximum and was stationary. The danger was no longer that of hemorrhage or of mechanical interference with respiration and heart action; what they had to fear was chiefly infection. Accordingly, in such cases as still showed fever, the first thing done was to remove some blood for bacteriological examination. Now the finding of infection was frequently not the simple matter that it might appear to be. While the blood effused into the pleura nearly always remains fluid for a long time, there is, nevertheless, in many cases, some degree of clotting, with the result that the pleural space might be divided up into two or more walled-off cavities, and the blood removed by one puncture might be sterile, while that from another puncture, in a different spot, would be infected. It therefore became the rule in the presence of fever, prolonged more than eight or nine days, or before that lapse of time, when clinical symptoms suggesting infection were present, to repeat punctures in different places until one had assured oneself that blood from all parts of the cavity had been examined. It happened on a number of occasions that a positive bacteriological finding on the third, fourth, or fifth puncture only was obtained. Another point was that bacteria apparently can be present in clots, and not break out and infect the general mass of blood for some days. The problem was thus often a more complicated one than we are accustomed to encounter in the ordinary empyemata of civil practice.

It was astonishing to find in how few cases, comparatively, infection did develop. Of course with clean bullet wounds it practically did not occur, but they had expected that fragments of high explosive would very often indeed carry in infection. So little was this the case that, speaking generally, empyema occurred in their cases only in about 14 per cent (11 to 82 analyzed). Of the empyemata which did develop the mortality was on the whole higher than in civil practice. Of the 11 cases just mentioned, four died—one from a streptococcus and anaerobic infection; two from a streptococcus septicemia, of which two, one really died from a secondary hemorrhage; and the fourth from the combination of streptococcus infection with multiple injuries. Of those which recovered, seven in number, six had streptococcus infection, one complicated by a streptococcus septicemia, and the seventh was chiefly infected by fecal bacilli.

In those cases that remained sterile their practice was to aspirate practically all of the pleural blood anywhere from the seventh to the twelfth day, but preferably early, and to replace simultaneously, but through a second needle, an amount of oxygen corresponding roughly with the amount of blood removed. This was to prevent secondary oozing. The author said he doubted if it had any such effect, but he continued it because it made the aspiration so easy and painless. The usual distressing cough toward the close of

aspiration was always prevented. The amount removed was usually from fifteen to thirty ounces, but he had taken off as much as eighty at one sitting without harm. They always did this under the control of manometer readings of intrapleural pressure. It was interesting to note that this was very rarely positive, and then only to the extent of 2 to 4 cm. (water) at the end of expiration. Negative pressure during inspiration ran usually from 8 to as high as 16 or 18 cm. of water.

Concerning the question of the removal of foreign bodies embedded in the lung, the English practice was to leave them alone. Among the French surgeons there grew up during 1915 and 1916 a strong tendency to remove all except the smallest. Marion, Duval, and a Bordeaux surgeon reported series of from 30 to 60 cases with practically no mortality, each upholding a different method. For himself, after his experience of removing some four or five, he came to the conclusion that from no point of view was it justifiable within at least the first month or two to remove foreign bodies by operation unless it could be shown that an abscess was developing around them. Now this was an interesting and somewhat surprising fact, that lung abscess around a foreign body, at any rate during the three to five weeks' stay of the men in France, was a thing of the utmost rarity.

FLIES IN FIELD SURGERY.

KANE (*International Journal of Surgery*, May, 1917) writes a vivid description of the pest of flies. It is stated that the wounded man, powerless to move, feels them creep over his face and hands, biting and tickling, rendering sleep impossible save through sheer exhaustion. (Even at night some species of flies are active.) Lighting about the eyelids and angles of the mouth and within the nostrils, they seek there to deposit their ova the moment the worn-out sufferer chances to drop asleep, or faints from pain and hemorrhage. They swarm around the margins of the blood pools to slake their thirst, being thus attracted in hordes. They light upon the dead and dying, and buzzing from one mangled soldier to another they carry to each a mixed contamination from the infirmities of all. In and upon the wounds they are the first infective agents. From the early gray light of dawn until the cool shades of evening they visit each nook and cranny of the mutilated surfaces, dropping everywhere their glossy masses of eggs, which finally may cover the entire surface with a moldy, frost-like incrustation of blows. Within twenty-four hours after delivery the hatching begins, and soon the area thus infected has been converted into an undulating mass of crawling, rolling, burrowing maggots. Not content with living upon the exposed surface of the wounds, these worms, straitened in their crowded quarters, seek fresh pastures in deeper tissues, going to considerable depths.

During field operating little can be done against the fly pest. Small smoke fires kindled to windward of the operating table, or on all sides if the breeze is variable, will to some extent serve as a protection.

THE POISONOUS PRINCIPLE OF POISON OAK.

MCNAIR (*Medical Record*, June 16, 1917) gives the following reasons for supposing the etiology of poison-oak dermatitis is not bacterial:

1. The incubation period, although it may occur in bacterial diseases, is in itself no absolute proof that the disease which it accompanies is bacterial. The incubation period is influenced by the dose, as can be easily proven by direct application of various alcoholic dilutions of the sap of rhus diversiloba on equal areas of skin and on anatomically corresponding places of the body.

2. Although immunity toward this poison may exist, no case has yet been proven when the fresh plant sap or its extracts have been directly applied to the skin. Nor has any artificial immunity been experimentally established.

3. Sensitiveness to many chemical irri-

tants is reduced or accentuated at times supposedly through a change in the physical resistance of the patient. Such a condition therefore constitutes no proof that bacteria alone may be thus affected.

4. Transmission of the disease from plant to person is not limited to the proximity of the plant. Actual contact with the resinous sap of the plant must occur. This can take place directly or indirectly—*e.g.*, the hands can carry the poison to such parts of the body that exterior clothing, etc., do not reach. The poison is not wind-carried unless by smoke, or possibly by dust and insects. The pollen is non-toxic.

5. The first appearance of the dermatitis may be on an area untouched directly by the plant, but not protected from subsequent indirect contagion.

6. Febrile symptoms accompany other diseases than those of bacterial origin. Febrile symptoms are the exception and not the rule in rhus diversiloba dermatitis.

7. Dr. Von Adelung in experiments with rabbits and guinea-pigs was unable to secure either immunity or anaphylaxis. Ford considered at one time that he had established immunity to Rhus toxicodendron. Upon repeating his experiments, however, he was unable to secure successful results.

In the consideration of the validity of the non-bacterial etiology of poison-oak (*Rhus diversiloba* T. and G.) dermatitis, circumstantial evidence, such as the incubation period, possible immunity, and possible anaphylaxis, which do not positively prove either the bacterial or chemical nature of the poison, is of little value. (Immunity and anaphylaxis may be obtained by proteins of bacterial as well as non-bacterial origin.)

The principal poisonous constituent of *Rhus diversiloba* by direct evidence is non-bacterial, for: (*a*) No bacteria have been isolated from the interior of the plant which will cause characteristic rhus dermatitis. (*b*) No bacteria have been isolated from the surface of the plant which will cause characteristic rhus dermatitis. An uninjured leaf, petiole, or green stem when rubbed on the skin of a sensitive person will not cause rhus dermatitis. Cultures on artificial media of bacteria from poison ivy (*Rhus toxicodendron* L.) by Burrill, and of bacteria from poison oak (*Rhus diversiloba* T. and G.) by Frost, have failed to produce characteristic rhus dermatitis. (*c*) No bacteria have been isolated from the serum of rhus dermatitis vesicles and cultivated which are capable of producing rhus dermatitis. (The presence of any bacteria in the serum may be due to secondary infection from scratching, etc.) (*d*) Serum from rhus dermatitis vesicles when rubbed on the skin (which may even be lacerated) of a susceptible individual will not cause rhus dermatitis. (*e*) Rhus dermatitis has only been successfully experimentally caused by direct contact with the resinous sap or sap products and the smoke from the burning plant. (*f*) Unlike bacteria, the poisonous principle of the sap is immiscible with water, glycerin, rabbit, ox, and human serum. (*g*) Unlike bacteria, when the sap is mixed in equal volume with 1:500 bichloride of mercury and kept for forty-eight hours the mixture is still poisonous. (*h*) Unlike bacteria, when the sap is heated to 210° F. for two hours it will still produce rhus dermatitis.

RECENT ARTICLES ON WAR SURGERY.

ALLISON in a clinical abstract (*Interstate Medical Journal,* April, 1917) quotes Eynard, who reports 124 cases, and writes a defense of the technique of the total removal of comminuted bone fragments, saying that this method of treatment is quite general among the French. He gives as his reasons that it is better to remove a little periosteum than to leave a single denuded fragment in a wound, and that for one piece of loose bone that will live there are many that will die and form sequestra. His operations were done within fifteen hours after the wounds were received, and his cases were evacuated from his hospital wearing plaster casts to immobilize the fractured area. He has had out of 25 forearm fractures 24 that had no complications. He followed them for a period of

four days. In 34 cases of shaft fracture of the humerus one died and there were four amputations, and two were followed for a period of four weeks. In 50 cases of leg fractures there were six amputations; nine cases were followed ten days, and three up to the time of union—four weeks. In fractures of the femur there was one death and one amputation in 15 cases. In the whole series of 124 cases there were two deaths and eleven amputations.

The interesting part about this paper is that the writer does not give or attempt to give any estimation of the ultimate results obtained. Of course the paper is of little value, except in the sense of pointing out what not to do in these cases.

The other paper is written by Cotte. This writer states that subperiosteal removal of bone fragments is the only method of preventing or curing infected open fractures and saving the limb. He notes that before the war this practice was condemned by most surgeons, but since then its value has been abundantly demonstrated. He allows that this procedure might result in pseudarthrosis, but believes it prevents this by putting the periosteum in healthy condition, and also it opens the medullary canal and guards against chronic infection of the shaft of the bone.

He reports 41 humerus fractures, 28 forearm fractures, and 46 leg fractures, making a total of 115 cases in the series. In these there were twelve amputations. In 81 of these primary removal of bone fragments was resorted to. In the same way as Eynard, he gives the ultimate results in only four cases out of 115, making his series of observations practically valueless.

In discussing these two papers it may be said that perhaps the most valuable surgical observation that has been made on the injuries sustained in the present war has been the observation that these compound comminuted fractures had best be treated with a high degree of conservatism. Bone fragments that seem detached and valueless have been shown by numerous observations to be perfectly viable, and have aided in the establishment of union and the reforming of normal anatomical contour in the shaft of the shattered bone. So much so is this the case that it is deemed very bad surgery by most men who have had experience in base hospitals to remove bone fragments at all. The essential requirement is to establish free drainage and the clearing up of infection by proper methods of irrigation and continued drainage.

Bosquette recommends that the treatment at first-aid stations should consist of the injection of salt solution and camphor oil to improve the patient's general condition, that bleeding should be stopped, that the wound should be superficially cleansed by the application of iodine and hypochlorite solution, and that the fractured extremity should be splinted, preferably in a wood splint, strapped to the side of the stretcher. When the patient has reached the hospital he should be rested in a warm bed for at least half a day before any operation is done, other than an urgent one. He recommends for operation the removal of shell fragments and other foreign material, and also advises the removal of all bone fragments not adherent to periosteum, and the establishment of drainage. He insists on the reduction of fragments and on rigid immobilization of them, and for this purpose advises a plaster cast. His paper is written on fractures of the thigh, and he states that unfortunately, due to the necessities of war surgery, most of his cases were not followed up to their conclusion. He states that casts are not well adapted to this type of fracture in the thigh, and retrieves himself partially from the error made by the other two authors in the following statement: "It is doubtful whether the removal of all loose bone is advisable in every case, for in some of those badly comminuted cases it results in a gap of several inches between the fragments, which renders bony union impossible without subsequent grafting."

These three papers perhaps present a fairly well-established view-point which has gained a certain following by surgeons operating in hospitals back of the first-aid

stations. It has been the experience in such hospitals as the American Ambulance at Neuilly that cases coming from a certain district behind the lines were all treated in this way, whereas those coming from other sections had been simply splinted and partially drained with hemorrhage more or less perfectly controlled. The contrast between these two groups of individuals at the end of three months leaves no question of doubt as to the inadvisability of radical measures in comminuted fractures. Many bones that were extremely shattered after the infection was controlled healed with good union, very good alignment, and practically no deformity. It seems advisable to very forcibly emphasize this observation.

RESULTS OF SURGICAL TREATMENT OF GASTRIC ULCER.

Balfour (*Surgery, Gynecology and Obstetrics*, June, 1917), basing his conclusions upon 677 gastric ulcers operatively demonstrated in the Mayo clinic during the past ten years, emphasizes the following facts:

For ulcers at the pylorus, posterior gastroenterostomy is the operation of choice in the poor surgical risk, for although pylorectomy is followed by better results, the operative mortality is distinctly higher. The cautery is a useful adjunct in selected cases.

For ulcers on the lesser curvature, cautery by the method described in a previous paper and gastroenterostomy is the operation of choice.

Local excision alone of such ulcers is inadequate, 32 per cent of patients so operated on requiring further operative treatment, viz., gastroenterostomy.

Sleeve or segmental resection, especially in large high ulcers and hour-glass contraction, in suitable cases is not only a relatively safe operation but has been followed by good results.

The lowest operative mortality in the more common operations was associated with cautery and posterior gastroenterostomy.

Ulcers on the posterior wall are associated with the highest operative risk, while those at the pylorus are of least risk.

REVIEWS.

A Handbook of Practical Treatment. By Many Writers. Edited by John H. Musser, Jr., B.S., M.D., and Thomas C. Kelly, A.M., M.D. Volume 4. W. B. Saunders Company, Philadelphia, 1917. Price $7.00.

Complete Index to Volumes I, II, III, IV, of Musser and Kelly's Practical Treatment. W. B. Saunders Company, Philadelphia, 1917.

Our readers may recall that a number of years ago the late Dr. John H. Musser associated with himself the late Dr. A. O. J. Kelly in the editing of a text-book on practical treatment, or, as it would have been called some years ago, a system of practical treatment. Unfortunately the brilliant career of Dr. Kelly was cut short by diabetes, and, still more unfortunately, Dr. Musser, like many other overworked physicians, died from aortic disease, both of them before the book was fairly on its way. The authors were however successful in obtaining a large number of skilful practitioners and writers, and the design of the present volume, edited by Dr. Musser's son and Dr. Kelly's brother, has been to bring up to date the themes which were discussed in the three volumes which made up the work when it first appeared. Articles by no less than 116 writers appear in this volume, which at once make it evident that some of the papers must be very brief. Indeed, there is no necessity in their being exhaustive, since the articles in the first three volumes were of this nature. Where deaths have occurred in the list of contributors new authors have attempted to bring the matter up to date, but in the majority of instances the original contributors have added nothing new which they have to say

to their original contributions. In some instances the editors themselves have made such emendations in articles as seemed to them advisable. A number of illustrative charts are found in the volume which are definitely clinical in their nature.

The design of the index volume is described in its title, the intention being to present the subscriber to the four volumes with an index whereby he can turn for such information as he desires to any page in any volume.

POLIOMYELITIS IN ALL ITS ASPECTS. By John Ruhräh, M.D., and Erwin E. Mayer, M.D. Illustrated. Lea & Febiger, Philadelphia, 1917. Price $3.25.

This very important topic, which was forced upon the profession so emphatically in 1916, is exhaustively and adequately considered in this contribution to the subject, which, with its bibliographies and indices, covers nearly three hundred pages. There are 118 engravings and two colored plates. The volume opens very naturally with a history of the disease, then our conceptions of the disease, its pathology, and the nature of its virus are discussed, and in the fifth chapter the epidemiology is considered. The various symptoms presented, more or less widely diffused as they are, are clearly described. The technique of lumbar puncture to aid in the diagnosis of the disease is given, and then follow chapters dealing with diagnosis, prognosis, and various forms of treatment by serum, orthopedic and operative measures, the final chapter dealing with muscle training, measures to be taken in an attempt to prevent the disease, and some anatomical and physiological reminders concerning it. The last chapter of all gives the dates of the various epidemics in different parts of the world up to 1911. So far this season poliomyelitis has been as rare as it was common last year, something which is to be devoutly thankful for, considering our very limited field of therapeutic procedure when a patient is stricken with it. In this book the reader will find practically everything that he can possibly want to know about the malady, so far as our present advances permit.

THE ROENTGEN DIAGNOSIS OF DISEASES OF THE ALIMENTARY CANAL. By Russell D. Carman, M.D., and Albert Miller, M.D. Illustrated. W. B. Saunders Company, Philadelphia, 1917. Price $6.00.

When we state that this volume of 558 pages contains no less than 504 original illustrations we are giving a pretty good idea of its characteristics and quality. This amounts to an illustration on almost every page. As a rule pictures showing conditions revealed by the *x*-rays are eminently unsatisfactory. Even if they are clear in the first few volumes which come from the press, the cuts become more and more clouded and less and less clear, but the authors and publisher in this instance are to be congratulated upon the fact that these illustrations are unusually clear and definite without having been so defined and touched up as to be distinctly artificial in their appearance. The volume, as its title shows, is devoted to the discussion of diseases and disorders of the alimentary tract as revealed by the *x*-ray. No attempt is made to deal with *x*-ray examinations of bones and joints, or of other parts of the body. The text reveals, as do the illustrations, a wide experience with a large number of interesting and important cases, and brief but important bibliographies are appended to a number of chapters, so that those who are interested may refer to particularly useful contributions made by others. The book is very handsomely printed, the heavy leading widely separating the lines, and the type is large. The quality of the paper would be considered unnecessarily heavy were it not that this heaviness is apparently essential in order that the illustrations may be well reproduced.

MATERIA MEDICA AND PRESCRIPTION WRITING. By Oscar W. Bethea, M.D., Ph.G., F.C.S. Second Edition, Illustrated. F. A. Davis Company, Philadelphia, 1917. Price $4.50.

In this second edition of Dr. Bethea's book we are told that an effort has been made to bring the text up to date particularly with reference to pharmaceutical changes. Some new drugs have been added. The text is arranged alphabetically and, as the title of the book indicates, it is devoted

to materia medica and prescription writing rather than to therapeutics or a discussion of the application of drugs to the cure of disease. Almost all drugs of any importance have from one-half to one page and an illustrative prescription appended. To illustrate what we mean, we refer to the article on chloroform; after giving its Latin and English name, describing its physiological characteristics and giving its dose and the preparations made from it, only a little more than a line is devoted to its therapeutic action, and then less than six lines to its use. Under its administration, however, nothing is said of its employment by inhalation for the production of anesthesia, but a page and a half is given to prescriptions showing how chloroform in the form of the water or the spirit, or the chloroform itself, may be administered. About half a page is also given to a prescription showing how it may be applied externally for the relief of neuralgia and rheumatism. Curiously enough under cinchona only two lines are devoted to its therapeutic use, but one-third of the article is given to cinchonism and its relief, and under administration a considerable number of prescriptions are given showing how quinine may be employed. The book undoubtedly presents much which is of value, particularly if it is used in association with some standard book on pharmacology or therapeutics.

THE BABY'S FOOD. By Isaac A. Abt, M.D. W. B. Saunders Company, Philadelphia, 1917.

In a little volume, of less than one hundred and fifty pages, Dr. Abt gives recipes, for the preparation of food for infants and children, designed to direct young mothers, nurses, and caretakers, and endeavors to give these persons information as to the minute details which are necessary in the preparation of foods for these classes of patients. "The Baby's Food" is an excellent little manual containing much practical information not only for the persons for whom it has been written but for physicians as well, who are often at a loss how to modify foods for either children or adults in such a way that they will be agreeable, nutritious, and, at the same time, suitable in the presence of disturbance of the digestive system.

A MANUAL OF DISEASES OF THE EYE. For Students and General Practitioners. By Charles H. May, M.D. Ninth Edition, Freely Illustrated. William Wood & Company, New York, 1917. Price $2.50.

We believe that we have reviewed most favorably every edition of this valuable little book, which made its first appearance in August, 1900. To have brought forth nine editions and to have kept the volume within bounds similar to the original first edition during all these years has required skilful editing on the part of the author. It is illustrated by many colored plates and black-and-white diagrams, and is undoubtedly the best small book on ophthalmology which is extant, as the appearance of nine editions in seventeen years indicates. Avoiding all the objectionable qualities of a quiz manual, nevertheless it deals with this large and important theme in a most efficient way. It is a book which the general practitioner and the specialist will both be glad to have.

DREAM PSYCHOLOGY. By Maurice Nicoll, B.A., M.D., B.C. Oxford University Press, London, New York, 1917. Price $2.00.

The author states in his preface that the dream is so common an experience that it is not surprising that the analytical spirit of the present age seeks to understand it, and, with this thought in mind, the author attempts to present his interpretation of dreams and the interpretation of their psychological processes as made by Jung and Freud, who he calls the pioneers of dream analysis. The Zurich school and the Vienna school vary widely in their conception of the cause and character of dreams.

We do not think that this is a book which will prove interesting to many of our readers. Like dreams themselves, it is characterized by a lack of definiteness which will not appeal to the hard-working, practical doctor; nevertheless, it presents much of interest to those who are keen in the study of these fanciful conditions, and at its close presents a brief bibliography

referring to sixteen of the prominent contributions which the author thinks have a definite bearing on his theme.

MEDICAL CLINICS OF NORTH AMERICA. Volume I, No. 1. July, 1917. W. B. Saunders Company, Philadelphia, 1917.

It is proposed by the publishers to present every two months a volume containing reports of clinics given by different practitioners in the large cities of the Union. The present number is called "The Johns Hopkins" issue and covers about 200 pages, six medical clinicians making up the list of contributors, and dealing with a very considerable number of subjects. The clinics appear as lectures or conferences between students and teachers as in ward-class work. The next issue in September will be called "The Philadelphia Number," and we are told will contain sixteen articles by different Philadelphia clinicians.

MODERN DIETETICS. By Lulu Graves. The Modern Hospital Publishing Company, St. Louis, 1917. Price $2.00.

The number of books which are now appearing upon the important subject of dietetics is very great. Some of them deal exhaustively with the problems of nutrition; others are more in the nature of cook-books. Those which are written by laymen, or laywomen, are usually of this type, and some of these books straddle the proposition and deal with it both from the standpoint of the cook-book and an attempt at a scientific discussion of the subject. This book is intended primarily to direct the feeding of the sick in hospitals and homes, but the author includes some studies on food for well people also. It contains nineteen chapters, the first of which, while homely in its nature, is, nevertheless, essential in institutional life in that it deals with proper methods of buying food and its judicious selection as to quantity, quality, and price, with a consideration of its storage and care, and a definition of what is a good cook. There then follows a discussion of the food value of certain products with the consideration of milk and its modifications, butter, its use and its substitutes, vegetables, and breakfast foods, fruits, various drinks, and various types of meat and fish. The remaining chapters deal with the diseases in which special diets are particularly advantageous, as in tuberculosis. The volume contains a little over two hundred pages, is well indexed, clearly printed, and is a good practical manual for nurses and dietitians.

SHELL SHOCK AND ITS LESSONS. By G. Elliott Smith, M.A., M.D., F.R.C.P., F.R.S., and T. H. Pear, B.Sc. Longmans, Green & Co., London, New York, Bombay, etc., 1917. Price $1, net.

The authors caution the reader that he should understand the term shell shock as indicating all those mental effects of war experience which are sufficient to incapacitate a man for the performance of military duties. They note that whatever may be the state of mind of a patient immediately after a mine explosion, the burial in his dugout, the sight and sound of his lacerated comrades, or other appalling experiences which finally incapacitate him for service in the firing line, by the time of his arrival in a hospital in England his reason and his senses are usually not lost but functioning with painful efficiency. It is in the emotional suffering that we must look for terms to describe the various conditions. There is an immense complexity of medical conditions and urgent need of obtaining and understanding the patient's past history before and during the war. The shock is often but the last straw.

It is noted that the most severe and distressing symptoms occur in the case of those patients whose past history shows that, far from possessing even the normal quota of timidity, they have been noted for their "dare-deviltry" and have been specially chosen as despatch-riders, snipers, and stretcher-bearers in the firing line.

Moreover, the seasoned regular non-commissioned officer may display the same symptoms as the raw recruit. He may have been in the army for many years and fought on previous occasions with great success. The general symptomatology is the protean one of neurasthenia.

As to treatment, isolation has a limited use. Suggestion and hypnosis are recommended as of great service at times. The value of work is insisted upon. Psychoanalysis is given greater importance. Finally, a psychiatric clinic is suggested.

A most readable book, and not without profitable lessons to all war surgeons.

COLLECTED PAPERS OF THE MAYO CLINIC, ROCHESTER, MINNESOTA. **Edited by Mrs. M. H. Mellish, Volume VIII, 1916. W. B. Saunders Company, Philadelphia and London, 1917. Price, cloth, $6.50 net; half-morocco, $8.50 net.**

Of the new books coming to the surgeon few, if any, excite more anticipation of pleasure and profit than these collected papers of the Mayo Clinic, since they go direct to the heart of things, deal intelligently and efficiently with problems presented to him, and set forth in complete and satisfactory detail the standard treatment for the conditions discussed. Herein are found Rosenow's papers on "Elective Localization of the Streptococcus from a Case of Pulpitis, Dental Neuritis, and Myositis," "The Causation of Gastric and Duodenal Ulcer by Streptococci," "The Etiology of Cholecystitis and Gall-stones and Their Production by the Intravenous Injection of Bacteria," "Elective Localization of Bacteria in Diseases of the Nervous System," "Epidemic Anterior Poliomyelitis."

William J. Mayo contributes a consideration of some of the maladies in which splenectomy may be indicated: "Radical Operations for the Cure of Cancer of the Second Half of the Large Intestine, not Including the Rectum;" "The Removal of Stones from the Kidney."

Charles H. Mayo contributes "An Appreciation of the Roentgen Ray and a Warning as to its Use in Surgical Diagnosis," "The Relative Merits of Cholecystostomy and Cholecystectomy," "Removal of the Right Colon: Indications and Technic."

Changes produced by the removal of the gall-bladder are considered by Judd and Mann. "Some of the Principles Involved in the Treatment of Patients Suffering from Obstructing Enlargement of the Prostate," "Surgery of the Thyroid," "Transplantation of the Ureter Following Traumatism and Resection of the Bladder for Cancer," by Judd.

By Kendall: "The Active Constituent of the Thyroid: Its Isolation, Chemical Nature, and Physiologic Action."

By Balfour: "Cancer of the Uterus: Its Surgical Treatment;" "Indications for Splenectomy in Certain Chronic Blood Disorders;" "Results of Surgical Treatment of Gastric Ulcer;" "Splenectomy for Repeated Gastrointestinal Hemorrhages."

By Beckman: "Early Operation for Severe Injuries of the Head—Report of Two Cases of Meningeal Hemorrhage;" "Tumors of the Spinal Cord: With a Report of Eighteen Cases."

"Clinical Data on Nephrolithiasis," by William F. Braasch; "Clinical Data on Polycystic Kidney."

By MacCarty: "Errors in the Diagnosis of Mammary Conditions;" "Clinico-Pathological Nomenclature of Mammary Conditions."

Plummer on "The Function of the Thyroid, Normal and Abnormal."

Wilson on "The Pathological Changes in the Sympathetic System in Goitre;" "Model of Gastric Tubules in Early Gastric Cancer."

These and many other papers show the scope of the work, indicate its value to all familiar with the spirit which actuates the clinic, and are sufficient indices to the effect that neither the surgeon nor the physician can afford to be without this book, nor can he best practice his profession without the added knowledge which its study will bring him.

IMPOTENCY, STERILITY, AND ARTIFICIAL IMPREGNATION. **By Frank P. Davis, Ph.B., M.D.C.V. Mosby Company, St. Louis, 1917.**

Under this title Davis publishes a discussion of the sexual appetite in its relation to the sense of smell, sense of hearing, and sense of sight. Thereafter he considers Impotency, Masturbation and Emissions, Race Suicide, Sterility, Artificial Impregnation, and Therapeutics in General.

Davis states that he has attempted to blaze a new trail. He writes with some vigor and pays a tribute to Ella Wheeler Wilcox, whom he says describes passionate love better than any other writer. Dr. Guiion is quoted as authority for a sure remedy for sterility—*i.e.*, that the woman should sing at the top of her voice during the copulative act. Under artificial impregnation a report is quoted to the effect that a western drug clerk in filling a prescription for some vaginal capsules filled one of them with semen, from the effect of which the young lady became pregnant. It is stated that by artificial impregnation many cases are relieved of barrenness.

Among the therapeutic remedies are mentioned gold, cannabis indica, cinchona, gaultheria, hops, hamamelis, nux vomica, cantharides, phosphorus, platinum, picric acid, potassium bromide, pulsatilla, saw palmetto, and many others, including zinc, incense, and yohimbin.

OBSTETRIC AND GYNECOLOGIC NURSING. By Edward P. Davis, A.M., M.D., F.A.C.S. Fifth Edition, Thoroughly Revised. W. B. Saunders Company, Philadelphia and London, 1917.

That there should be a fifth edition of this excellent book evidences its value to both the medical and the nursing professions. Indeed it is so rationally conceived and so clearly written that it is largely purchased by the laity, who thus are enabled to exercise an intelligent supervision over childbirth and its sequels.

After a preliminary chapter on Anatomy, Physiology, and Prenatal Care, Nursing of Normal Pregnancy is discussed in much detail. Thereafter follow sections upon The Nursing of Complications of Pregnancy, The Description of Labor and Preparations for It, The Lying-in Period, the Care of the New-born Child, and the Accidents of Pregnancy and Labor. Full details, from the nurse's standpoint, are given concerning obstetric surgery. Space is devoted to Nursing in Puerperal Sepsis, and Puerperal Mania. Thereafter the question of Partial or Mixed Feeding; Weaning; Artificial Feeding is considered at length; and The Care of Prematurely Born Children; Disorders of Infancy and the Development of the Child.

The second part of the book is devoted to Surgical Nursing. After some introductory pages the examination of the patient is described at length, together with local treatment and general care.

Finally, gynecological operations and postoperative treatment are taken up.

The book ends with a chapter on Venereal or Specific Disease and an appendix containing the Dietary, Preparation of Surgical Supplies, Other Methods for the Preparation of Surgical Supplies, and Aseptic Precautions.

This whole work is extraordinarily comprehensive considering its size, is characterized by sound common sense, clear vision of the end to be attained, and the promptest and safest way to reach it.

THE TREATMENT OF EMERGENCIES. By Hubley R. Owen, M.D. Illustrated. W. B. Saunders Company, Philadelphia and London, 1917.

This book is primarily written for the instructors in first aid to the injured, for police and fire surgeons, for ambulance surgeons, for resident physicians, for nurses, and for those laymen who wish to make a more comprehensive study of the subject. It is written with simple directness and the avoidance of technical terms, which makes its matter entirely available to any man of ordinary intelligence. Its teaching is essentially sound, in accordance with the best practice of the day. The subject-matter covered includes Fractures, Contusions and Wounds, Hemorrhage, Sprains and Dislocations, Burns and Scalds, The Effects of Heat and Cold upon the Tissues, Asphyxiation, Drowning, Convulsions, Unconsciousness, Effects Produced by Lightning, Foreign Bodies, Antiseptics, Bandaging, Transportation, Poisons and Their Treatment, and Household Remedies.

The subject-matter is well covered in something under 350 pages. The illustrations admirably supplement the text. A thoroughly sound and practical book, which might well form the text of public school training.

CORRESPONDENCE.

ELECTRICITY IN THE TREATMENT OF GOITRE.

To the Editor of the THERAPEUTIC GAZETTE.

SIR: My opinion of the value of electricity in the treatment of goitre is that the only types that can be considered as amenable to electrical treatment are the simple and exophthalmic goitres. The cystic and colloid types belong entirely to the field of operative surgery. Simple goitres may be reduced in size or made to entirely disappear by prolonged iodine ionization. By this is meant the electrolytic dissociation of iodine from potassium iodide and driven into the goitre by means of the negative galvanic current. A two-per-cent solution of potassium iodide is used and a pad of cotton or some other absorbent material saturated with it and placed over the goitre; a similar pad of larger size saturated with water or salt solution placed on some indifferent part of the body, preferably the nape of the neck or between the shoulders. A current of ten to fifteen milliamperes is employed, and treatments should be triweekly, with no less than one hour for each treatment. With persistence this treatment produces very positive results. Appropriate systemic treatment should be instituted at the same time, such as thyroid extract, and the ionic treatment may be supplemented by some preparation of iodine internally.

The *x*-ray may ofttimes produce a reduction in size of the thyroid, but I consider the ionic method safer, as the *x*-ray causes a harmful influence upon the parenchyma of the gland and the secretion. I have never seen any benefit from the use of the high-frequency current in this condition.

Exophthalmic goitre should never be treated by iodine ionization, as the condition will be aggravated by its use, nor should thyroid extract be used for obvious reasons, although I have seen this mistake made. Plain, negative galvanism may be employed directly to the goitre, with positive pole directly opposite at nape of neck, with some hope of systemic relief, namely, the improvement of the tachycardia and general prostration. These symptoms sometimes recur when treatment ceases. The faradic current, static wave, high-frequency vacuum tube, and diathermy currents may ofttimes produce the same results, or they may be used alternately. How these currents act is unknown, but a possible explanation is an alteration of nutrition in the thyroid itself, plus the stimulating action upon the vagus, thus inhibiting the thyroid secretion.

The *x*-ray, however, properly employed, is far and away the best *physical* measure for the treatment of exophthalmic goitre, for it acts directly upon the gland in lessening the secretion. By its use the cardiac condition may often be restored to normal, the tremors disappear, the gland itself is reduced in size, and general health is improved. The exophthalmos, however, is not influenced as much as the other objective symptoms. The *x*-rays do not act in all cases alike, but it is my conviction that all cases should be treated by the *x*-rays with the hope of success before resorting to operative surgery.

Very truly yours,

W. L. CLARK,
Lecturer on Electrotherapeutics, Jefferson Medical College.

PHILADELPHIA.